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Ohio State University Bulletin

College of Agriculture and Domestic Science



FEBRUARY 14, 1907 T

PUBLISHED BY THE UNIVERSITY AT COLUMBUS

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1907/08-11/12

UNIVERSITY CALENDAR

1907

Entrance examinations, (8 a. m.) Tuesday to Saturday,
June 11 to 15.

Summer term, June 24 to August 2.

Entrance examinations, (8 a. m.) Tuesday to Saturday,
September 10 to 14.

First term begins—Registration Day—Tuesday, September 17.

President's Annual Address, (11 a. m.) Friday, September 20.

Latest date of admission to candidacy for a degree at the
Commencement of June, 1908, Tuesday, October 1.

Thanksgiving recess, November 28 and 29.

Latest date for filing theses subjects, Saturday, December 14.

First term ends, Wednesday, December 18.

CHRISTMAS VACATION

1908

Second term begins—Registration Day—Thursday, January 2.

Washington's Birthday, Saturday, February 22.

Second term ends, Friday, April 3.

SPRING RECESS

Third term begins—Registration Day—Wednesday, April 8.

Field Day—Athletic Association—Saturday, May 9.

Competitive Drill—Cadet Regiment—Saturday, May 23.

Memorial Day, Saturday, May 30.

Final examinations, Friday to Thursday, June 12 to 18.

Latest date for presenting theses, Saturday, June 13.

Entrance examinations, (8 a. m.) Tuesday to Saturday,
June 16 to 20.

Latest date for filing bound copy of thesis, Friday, June 19.

Commencement, Wednesday, June 24.

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OHIO STATE UNIVERSITY

The Ohio State University, located in Columbus two miles north of the Union Station, is a part of the public educational facilities maintained by the State. It comprises six colleges :

The College of Agriculture and Domestic Science,
The College of Arts, Philosophy, and Science,
The College of Engineering,
The College of Law,
The College of Pharmacy,
The College of Veterinary Medicine.

This bulletin of announcements is devoted exclusively to the work of the College of Agriculture and Domestic Science.

(NOTE: In requesting any of the announcement bulletins of the University, address the Secretary of the University Faculty, Ohio State University, Columbus, Ohio.)

COLLEGE OF AGRICULTURE AND DOMESTIC SCIENCE

The College of Agriculture and Domestic Science offers seven distinct courses of study:—

1. A four-year course in Agriculture.
2. A four-year course in Horticulture and Forestry.
3. A two-year course in Agriculture.
4. A special course in Dairying.
5. A ten-weeks winter course in Agriculture.
6. A four-year course in Domestic Science.
7. A two-year course in Domestic Science.

The four-year courses of this College are regular collegiate courses of the University and lead to the degrees of Bachelor of Science in Agriculture, Bachelor of Science in Horticulture and Forestry, and Bachelor of Science in Domestic Science. The requirements for admission to these courses are given in the following pages.

The short courses are for students who are not so well prepared and are unable to spend four years in the University. It has been found that one year of the short course often prepares a student for the four-year course, and that a large proportion of those who enter the short courses find time and means to continue one of the four-year courses.

FACULTY AND INSTRUCTORS

WILLIAM OXLEY THOMPSON, D. D., LL. D., PRESIDENT of the University.

HOMER CHARLES PRICE, M. S. A., DEAN, Professor of Rural Economics, and Manager of University Farm.

ALFRED VIVIAN, Ph. G., SECRETARY, Professor of Agricultural Chemistry.

WILLIAM RANE LAZENBY, M. Agr., Professor of Horticulture and Forestry.

HENRY ADAM WEBER, Ph. D., Professor of Agricultural Chemistry.

GEORGE WELLS KNIGHT, Ph. D., Professor of American History and Political Science.

ALBERT MARTIN BLEILE, M. D., Professor of Anatomy and Physiology.

WILLIAM ASHBROOK KELLERMAN, Ph. D., Professor of Botany.

JOSEPH VILLIERS DENNEY, A. B., Professor of English.

WILLIAM MCPHERSON, Ph. D., Professor of Chemistry.

DAVID STUART WHITE, D. V. M., Professor of Veterinary Medicine.

HERBERT OSBORN, M. Sc., Professor of Zoology and Entomology.

FRANK EDWIN SANBORN, S. B., Professor and Director of the Department of Industrial Arts.

JOHN ADAMS BOWNOCKER, D. Sc., Professor of Inorganic Geology.

JOHN WRIGHT DECKER, B. Agr., Professor of Dairying.

MINNIE AVA NELLIE STONER, B. Sc., Professor of Domestic Science.

CHARLES SUMNER PLUMB, B. Sc., Professor of Animal Husbandry.

SEPTIMUS SISSON, B. Sc., V. S., Professor of Comparative Anatomy.

LEWIS A. RHOADES, Ph. D., Professor of Germanic Languages and Literatures.

CHARLES BRADFIELD MORREY, M. D., Professor of Bacteriology.

JAMES EDWARD HAGERTY, Ph. D., Professor of Economics and Sociology.

THOMAS EWING FRENCH, M. E., Professor of Engineering Drawing.

ARTHUR GILLET McCALL, B. Sc. (Agr.), Professor of Agronomy.

GEORGE WASHINGTON MCCOARD, M. A., Associate Professor of Mathematics.

CHARLES A. BRUCE, B. A., Associate Professor of Romance Languages.

JOHN H. SCHAFFNER, A. M., M. S., Associate Professor of Botany.

JAMES STEWART HINE, B. Sc., Associate Professor of Entomology.

FRANCIS LEROY LANDACRE, B. A., Associate Professor of Zoology.

VIRGINIA BABB, B. D., Associate Professor of Domestic Art.

JAMES A. FOORD, M. S. A., Associate Professor of Agronomy.

CARL W. GAY, D. V. M., B. S. A., Associate Professor of Animal Husbandry.

CHARLES LINCOLN ARNOLD, M. Sc., Assistant Professor of Mathematics.

A. H. TUTTLE, M. A., Assistant Professor of American History and Political Science.

VERNON HAYES DAVIS, M. S. A., Assistant Professor of Horticulture.

EDGAR S. INGRAHAM, Ph. D., Assistant Professor of Romance Languages.

ROBERT F. EARHART, Ph. D., Assistant Professor of Physics.

JOSEPH NELSON BRADFORD, M. E., Professor of Architecture.

EMILY E. BRACKEN, Professor of Art.

DAVID R. MAJOR, Ph. D., Professor of Education.

GEORGE L. CONVERSE, Captain U. S. A., Professor of Military Science and Tactics.

OLIVE JONES, A. B., Librarian.

H. S. WINGERT, M. D., Director of Physical Education for Men.

BERTHA HOPKINS, B. Ph., Director of Physical Education for Women.

A. B. GRAHAM, Superintendent of Agricultural Extension.

BERTHOLD AUGUST EISENLOHR, B. Ph., Assistant Professor of the Germanic Language and Literatures.

WILLIAM LUCIUS GRAVES, M. A., Assistant Professor of English.

GEORGE H. MCKNIGHT, Ph. D., Assistant Professor of English.

WILLIAM LLOYD EVANS, Ph. D., Assistant Professor of Chemistry.

CARSON SAMUEL DUNCAN, M. A., Assistant Professor of English.

GEORGE DAVID HUBBARD, Ph. D., Assistant Professor of Geology.

CHARLES C. MAJOR, M. E., Assistant Professor of Engineering Drawing.

JOHN B. PRESTON, M. A., Assistant Professor of Mathematics.

J. WARREN SMITH, M. Sc., Lecturer on Meteorology.

WILLIAM H. RENCK, Instructor in Pattern Making and Founding.

CHARLES P. CROWE, Instructor in Forging.

C. A. PARK, Assistant in Astronomy.

E. F. MANGOLD, Instructor in Dairy Mechanics.

E. S. GUTHRIE, Instructor in Buttermaking.

W. H. FREUND, Instructor in Cheesemaking.

WILLIAM HENRY PALMER, B. S. A., Fellow in Animal Husbandry.

*LELAND E. CALL, Fellow in Agricultural Chemistry.

*HARVEY C. RAMSOWER, Fellow in Agricultural Chemistry.

JOHN CHISHOLM, Superintendent of the University Farm.

*Resigned.

ADMISSION

Applicants for admission must be at least sixteen years of age. The College is open on equal terms to both sexes.

UNIVERSITY ENTRANCE BOARD

The admission of students is in charge of the University Entrance Board, which determines the credits which shall be issued on all entrance examinations and certificates, and furnishes all desired information to applicants. Correspondence relating to admission should be addressed to the Entrance Board, Ohio State University, Columbus.

ADMISSION TO THE COURSE LEADING TO A DEGREE

There are two modes of admission to the course leading to a degree: (a) by examination, (b) by certificate.

ADMISSION BY EXAMINATION

The Entrance Board will conduct entrance examinations June 11 to 15 and September 10 to 14, 1907. A part of the examinations may be taken in June and the remainder in September. All applicants for admission who are not graduates of an accredited or recognized secondary school or approved preparatory school, or who do not possess certificates from the State Board of School Examiners, must take examinations for admission.

SCHEDULE.—Examinations will be from 8 to 12 a. m. and from 1 to 5 p. m.

TUESDAY

A. M.—Greek and Roman History, English History, General History.

P. M.—Composition, Rhetoric and Classics, Chemistry, Geology.

WEDNESDAY

A. M.—Algebra, German, Eng'ish Grammar, Descriptive Geography.

P. M.—Plane Geometry, Physical Geography, Arithmetic.

THURSDAY

A. M.—Civics, Solid Geometry, Zoology.

P. M.—Beginning Latin, Cæsar, Astronomy.

FRIDAY

A. M.—Physics, Physiology, Botany.

P. M. U. S. History, French, English Literature.

SATURDAY

A. M.—Virgil, Cicero.

ADMISSION BY CERTIFICATE

Applicants may be admitted without examination on presentation of properly indorsed certificates from such secondary schools as have been accredited* or recognized by the University, or from approved normal schools, or from the State Board of School Examiners under the following provisions:

(a) If from secondary schools, the certificate must show that the applicant is a graduate in good standing of the school issuing it; and also must state in detail the studies pursued, the text-books used, the amount of work done in each study, the amount of time devoted to it, and the fact that the applicant has passed in the work.

(b) Any entrance requirement not covered by a certificate must be met by examination.

Blank certificates may be obtained by addressing the Secretary of the Entrance Board. Certificates should be filled out and returned to the University as early as possible after the close of schools in June and in any event not later than September 7.

*Regarding accredited and recognized schools see page 18 and following.

REQUIREMENTS BY UNITS*

Applicants to be admitted to full standing must obtain credit by examination or certificate for twelve units, chosen from the five groups which follow, subject to the restrictions stated therein.

No applicant will be admitted with total conditions in excess of two units, not counting the requirements in group E, but in no case with conditions amounting to more than three units.

(A) ENGLISH GROUP

Two units are required in this group.

English Composition and Rhetoric.....	I unit
English Classics	I unit
English Literature	I unit

(B) HISTORY GROUP

Two units are required in this group.

Civil Government	$\frac{1}{2}$ unit
United States History.....	$\frac{1}{2}$ unit
General History	$\frac{1}{2}$ or 1 unit
Greek and Roman History.....	$\frac{1}{2}$ or 1 unit
English History	$\frac{1}{2}$ unit

(C) MATHEMATICS GROUP

Two units are required in this group, consisting of Algebra (through quadratics) and Plane Geometry.

Algebra (through quadratics)	I unit
Algebra (beyond quadratics)	$\frac{1}{2}$ unit
Geometry (plane)	I unit
Geometry (solid and spherical)	$\frac{1}{2}$ unit

*A unit is a course of study covering a school year of not less than thirty-five weeks, with four or five periods of at least forty-five minutes each per week.

(D) SCIENCE GROUP

Two units are required in this group, including Physics and Botany.

Physics	1 unit
Physical Geography	$\frac{1}{2}$ unit
Botany	$\frac{1}{2}$ unit
Chemistry	1 unit
Physiology	$\frac{1}{2}$ unit
Zoology	$\frac{1}{2}$ unit
Elements of Agriculture	$\frac{1}{2}$ unit

(E) FOREIGN LANGUAGE GROUP

Two units are required in this group; and two additional units from this or the preceding groups.

Latin	2 to 4 units
Greek	2 to 4 units
German	2 to 4 units
French	2 to 4 units
Spanish	2 to 4 units

The extent and character of the work required in each subject mentioned above is described on page 14.

ADMISSION WITH ADVANCED STANDING

Applicants for admission with advanced standing must first satisfy the entrance requirements in the ways described. By presentation of satisfactory certificates, or by examination, they may then obtain any advanced credits to which they are entitled.

Applicants who have successfully completed at least one year's work in an approved college, and who bring official and explicit certificates describing their course of study and scholarship, and also certificates of honorable dismissal, will be admitted without examination and without entrance conditions.

REQUIREMENTS FOR THE SHORT COURSES

DOMESTIC SCIENCE

The following are the requirements :

1. Arithmetic, Descriptive and Physical Geography, English Grammar, and United States History.
2. English—(a) Composition and Rhetoric.
(b) English Classics.
3. Algebra.
4. Plane Geometry.
5. Civil Government.
6. General History.

AGRICULTURAL AND DAIRYING

Applicants, unless over twenty-one years of age, must pass an examination in Arithmetic, Geography, Grammar, and United States History, or bring high school or other certificates for these branches. The requirements for English Grammar in the Short Courses may be met by writing a business letter or theme on some practical subject. Applicants who are over twenty-one are admitted without examination.

GRADUATE STUDY

Graduates of this College or of other institutions of approved standing may on application to the faculty enter this College and pursue such lines of work as may be arranged and approved by the Graduate Committee. Such students are subject to all the ordinary regulations prescribed for undergraduates.

Masters' degrees are conferred upon graduates at the end of not less than one year's residence, which shall be wholly devoted to the completion of an approved course of study. Each candidate is required, in addition, to present an acceptable thesis upon some subject connected with his course of study.

DESCRIPTION OF SUBJECTS ACCEPTED FOR AD-
MISSION TO THE COURSE LEADING
TO A DEGREE

(A) ENGLISH GROUP

ENGLISH COMPOSITION AND RHETORIC. One unit. Each applicant must be able to write clear and correct English, and no applicant will be accepted in English whose work is seriously defective in spelling, punctuation, grammar, and paragraph structure. The proper preparation for this part of the requirement is practise in composition through the four preparatory years, with correction of themes by the teacher and revision by the pupil. Subjects for themes should be taken from the books prescribed for general reading below and also from the pupil's observation and experience. Practise should be afforded in writing narrative, description, exposition and argumentation. Applicants should be familiar with those principles of Rhetoric which are most helpful in elementary composition; viz., the principles of sentence structure, outlining, paragraphs, and choice of words. The amount and kind of work required is indicated in Scott and Denney's *Elementary Composition and Composition-Literature*.

ENGLISH CLASSICS. One unit. (a) A thorough knowledge of the subject-matter, form, and structure of Shakespere's *Macbeth*, Milton's *Lycidas*, *Comus*, *L'Allegro*, *Il Penseroso*; Burke's *Speech on Conciliation with America* (or Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*); Macaulay's *Life of Johnson* (or Carlyle's *Essay on Burns*). (b) A general knowledge of the substance of ten books selected from the following groups: Group 1 (two to be selected), Shakespere's *As You Like It*, *Julius Cæsar*, *Merchant of Venice*, *Twelfth Night*, *Henry the Fifth*; Group 2 (one to be selected), Bunyan's *Pilgrim's Progress*, part 1; Bacon's *Essays*, *The Sir Roger de Coverley Papers in the Spectator*, *Franklin's Autobiography*; Group 3 (one to be selected), Chaucer's *Prologue*, selections from Spenser's *Faerie Queene*, Pope's *Rape of the Lock*, Goldsmith's *Deserted Village*, Palgrave's *Golden Treasury*, first series, books ii and iii, with especial attention to Dryden, Collins, Gray, Cowper, and Burns; Group 4 (two to be selected), Hawthorne's *House of the Seven Gables*, Thackeray's *Henry Esmond*, George Eliot's *Silas Marner*, Dickens' *A Tale of Two Cities*, Scott's *Ivanhoe*, *Quentin Durward*, Goldsmith's *Vicar*

of Wakefield, Mrs. Gaskell's *Cranford*, Blackmore's *Lorna Doone*; Group 5 (two to be selected), Emerson's *Essays* (selected), Ruskin's *Sesame and Lilies*, Irving's *Sketch Book*, Carlyle's *Heroes and Hero Worship*, DeQuincey's *Joan of Arc* and the *English Mail Coach*, Lamb's *Essays of Elia*; Group 6 (two to be selected), Palgrave's *Golden Treasury*, first series, book iv., with especial attention to Wordsworth, Keats, and Shelley, Coleridge's *Ancient Mariner*, Lowell's *Vision of Sir Launfal*, Scott's *Lady of the Lake*, Poe's *Poems*, Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, *The Passing of Arthur*, Arnold's *Sohrab and Rostum*, Byron's *Mazeppa*, *The Prisoner of Chillon*, Macaulay's *Lays of Ancient Rome*, and Browning's *Cavalier Tunes*, *Lost Leader*, *How They Brought the Good News*, *Evelyn Hope*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *The Boy and the Angel*, *One Word More*, *Herve Riel*, *Pheidippides*.

ENGLISH LITERATURE. One unit. A good knowledge of the leading facts in the history of English Literature, as given in Scudder's *English Literature*, Johnson's *History of English and American Literature* or the *Introductions* by Pancoast, Painter, Halleck, or Newcomer; together with the reading of representative works of literature. This may be offered in lieu of the work in English Classics.

(B) HISTORY GROUP

CIVIL GOVERNMENT. One-half unit. A good knowledge of the origin, principles, forms and powers of the national, state, and local governments is expected. Fiske's *Civil Government*, with a special study of the state from which the student comes, may serve to indicate the amount and kind of knowledge sought.

UNITED STATES HISTORY. One-half unit. A good knowledge of the main facts and features of American History, especially of the period since 1750, is expected. McLaughlin's *History of the American Nation*, Montgomery's *Student's American History* or Hart's *Essentials in American History* will serve to show the kind and amount of knowledge sought. No credit upon certificate will be accorded in this subject for work done below the ninth grade.

GENERAL HISTORY or MEDIAEVAL AND MODERN HISTORY. One unit or one-half unit. Adams' *European History* or Harding's

Essentials in Mediæval and Modern History, Myers' Mediæval and Modern History (revised), or an equivalent.

GREEK AND ROMAN HISTORY. One-half or one unit. Botsford's Ancient History for Beginners, or West's Ancient World, or Wolfson's Essentials in Ancient History, or an equivalent.

ENGLISH HISTORY. One-half unit. Higginson and Channing's English History for Americans, or Walker's Essentials in English History, or Cheyney's Short History of England, or an equivalent.

(C) MATHEMATICS GROUP

ALGEBRA. One unit. Taylor's Elements of Algebra, or an equivalent. Special attention should be given to the four fundamental operations (single and system), factoring, highest common factor, lowest common multiple, fractions and fractional equations, involution, evolution, surds, complex quantities, quadratic equations solved by factoring, by completing the square and the general formula.

ALGEBRA. One-half unit. A thorough review of the work above named, irrational equations, simultaneous quadratic equations, higher equations solvable by factoring, ratio, proportion, progressions, theory of exponents, binominal theorem for positive integral exponents, and use of five-place tables of logarithms. It is recommended that this work be taken in the last year of the high school course.

GEOMETRY. One unit. Venable, White, Wells, Wentworth, Beaman and Smith, or an equivalent. Plane geometry with solution of originals.

GEOMETRY. One-half unit. Solid and spherical geometry, with solution of originals given in the text-books named above.

(D) SCIENCE GROUP

PHYSICS. One unit. Carhart and Chute's Elements, Gage's Elements, Avery's Elements, or an equivalent. Four recitation periods per week, including drill on simple numerical problems is recommended. A laboratory period of not less than two hours per week, to accompany the work of the text-book, is strongly urged, but is not required for the present.

PHYSICAL GEOGRAPHY. One-half unit. Tarr's, Dryer's, Davis', or Gilbert and Brigham's Physical Geography.

BOTANY. One-half unit. Equivalent of the work outlined in an elementary text-book (such as Coulter's, Bailey's, Bergin's, Andrews', Leavitt's, Kellerman's) and of a small hand book of the local flora (Kellerman's Spring Botany), which requires one-half year.

CHEMISTRY. One unit. McPherson and Henderson's Elementary Study of Chemistry, and "Exercises in Chemistry" arranged to accompany the same, or the equivalent. The course should consist of at least three recitations and four hours of laboratory work weekly.

PHYSIOLOGY. One-half unit. Martin's Human Body (Briefer Course). No credit will be accorded in this subject for work done below the ninth grade.

ZOOLOGY. One-half unit. Jordan, Kellogg, and Heath's Animal Studies; Kellogg's "Elementary Zoology"; Davenport's "Introduction"; or equivalents, with laboratory or field work.

GEOLOGY. One-half unit. Brigham's, Dana and Rice's (revised), Tarr's, or LeConte's may be used as texts. The recitations should be supplemented by study of the geological phenomena and formations found in the vicinity of the school.

ELEMENTARY AGRICULTURE. One-half unit. Texts: Jackson and Dougherty or Bailey.

(E) FOREIGN LANGUAGE GROUP

LATIN. First unit. Pronunciation (Roman method); Grammar (an exact knowledge of the inflections). Second unit. Cæsar, the first four books of the *De Bello Gallico*. Third unit. Cicero, six orations of Cicero, including *Pro Lege Manilia*. Fourth unit. Vergil, the first six books of the *Aeneid* with Prosody; and Prose Composition, Daniel, or Collar, or Bennett, or Dodge and Tuttle, entire. Latin cannot be continued as a university study unless at least three units are offered for admission. Pupils should be trained to the systematic use of the grammar from the outset.

GREEK. First unit. Grammar (Goodwin's preferred) and Prose Composition; or White's First Greek Book. Second unit. Reading: The first three books of Xenophon's *Anabasis*. A third unit

will be allowed for preparation in the fourth, fifth, and sixth books of the *Anabasis* and three books of Homer's *Iliad*, and a fourth unit for additional reading in Greek.

GERMAN. Two units. The pupil must possess a good pronunciation and be able to read or to translate at sight easy narrative prose, showing an exact and ready knowledge of the declensions and conjugations of the language. The ordinary principles of syntax and of word-order must be thoroughly mastered and such knowledge shown by the ability to translate easy sentences into German. Some three hundred pages of simple prose and poetry must be read.

Four units. In addition to the above, the applicant must have had two years more of instruction, including the reading of from four to five hundred pages of standard prose and at least one of Schiller's dramas, with not less than fifty pages of work in prose composition.

FRENCH. Two units. Applicants should be able to pronounce French accurately, to read at sight easy French prose, to put into French simple English sentences taken from the language of everyday life or based upon a portion of the French text read, and to answer questions on the rudiments of the grammar as defined below. During the first year the work should comprise: (1) Careful drill in pronunciation; (2) the rudiments of grammar, including the inflection of the regular and the more common irregular verbs, the plural of nouns, the inflection of adjectives, participles, and pronouns; the use of personal pronouns, common adverbs, prepositions, and conjunctions; the order of words in the sentence and the elementary rules of syntax; (3) abundant easy exercises, designed not only to fix in the memory the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; (4) the reading of from 100 to 175 duodecimo pages of graduated texts, with constant practise in translating into French easy variations of the sentences read (the teacher giving the English), and in reproducing from memory sentences previously read; (5) writing French from dictation. During the second year the work should comprise: (1) The reading of from 250 to 400 pages of easy modern (nineteenth century) prose in the form of stories, plays or historical or biographical sketches; (2) constant practise, as in the previous year, in translating into French easy variations upon the texts read; (3) frequent

abstracts, sometimes oral and sometimes written, of portions of the text already read; (4) writing French from dictation; (5) continued drill upon the rudiments of grammar, with constant application in the construction of sentences; (6) mastery of the forms and use of pronouns, pronominal adjectives, of all but the rare irregular verb forms, and of the simpler uses of the conditional and subjunctive.

Four units. In addition to the above, the applicant should be able to read at sight, with the help of a vocabulary of special or technical expressions, difficult French not earlier than that of the seventeenth century; to write in French a short essay on some simple subject connected with the words read; to put into French a passage of easy English prose and to carry on a simple conversation in French.

SPANISH. Two units. Applicants should be able to pronounce Spanish accurately, to read at sight easy Spanish prose, to put in Spanish simple English sentences taken from the language of everyday life or based upon a portion of the Spanish text read, and to answer questions on the essentials of the grammar. The first year should be spent mainly on the grammar with easy reading and oral practise; the second devoted to reading good modern Spanish, with grammatical analysis and exercises in writing. The texts read should be chiefly narrative and conversational prose, including one or more prose dramas of the present age.

Four units. In addition to the above, the applicant should be able to read at sight, with the help of a vocabulary of special or technical expressions, difficult Spanish, whether prose or poetry; to write in Spanish a short essay on some simple subject connected with the works read, which shall show a thorough knowledge of syntax; to put into Spanish a passage of easy English prose, and to carry on a simple conversation in Spanish.

LIST OF ACCREDITED AND RECOGNIZED SCHOOLS IN OHIO

Accredited schools are those four-year secondary schools whose courses of study have been found by inspection to be capable of satisfactorily preparing students for all colleges of the University.

Recognized schools are those three or four-year secondary schools whose courses of study are not capable of preparing students for all colleges of the University, but which have been found by inspection to cover satisfactorily 10 units of the requirements for admission.

These lists are subject to change from year to year as schools are revisited. Persons are advised, therefore, to consult the latest bulletins and catalogues of the University. A shows that a school is accredited; R, that it is recognized.

School	Superintendent	Principal
Akron, A	H. V. Hotchkiss	D. C. Rybolt
Alliance, R	J. E. Morris	J. W. Guthrie
Andover, R	S. A. Harbourt	Mary McDonald
Ashland, A	E. P. Dean	F. C. Clark
Ashtabula, A	R. P. Clark	Lillian Kurtz
Ashville, R	Stanley Lawrence	
Athens, A	F. S. Coultrap	Zella Foster
Baltimore, R	J. H. Horton	J. J. Wagner
Barberton, R	J. M. Carr	G. M. Korns
Barnesville, A	L. E. York	A. J. Gerber
Batavia, R		
Bedford, R	J. E. Pettit	Mary E. Hopkinson
Bellaire, A	J. R. Anderson	Alice Cunningham
Bellefontaine, A	J. W. MacKinnon	Annie A. Price
Bellevue, R	E. F. Warner	H. C. Bates
Bethel Township, Clark Co., R	Alfred Ross	Irene Dornblaser
Bethel Township, Miami Co., R	R. W. Crist	Walter Peoples
Bluffton, R		
Bowling Green, A	N. D. O. Wilson	
Bryan, A	J. W. Wyandt	Orville Smith
Bucyrus, A	J. J. Bliss	C. H. Miller
Caldwell, R	C. J. Foster	Patrick Henry
Cambridge, A	H. Z. Hobson	John H. Harding
Camden, R	J. L. Fortney	L. D. Brouse
Canal Dover, A	F. P. Geiger	A. J. Huffman
Canal Winchester, R	J. R. Clements	Alma Jennings
Canton, A	John K. Baxter	Chas. A. Armstrong
Carey, R	J. L. Lashey	Mattie Myers
Celina, R	S. Wilkin	J. W. Pogue

School	Superintendent	Principal
Chargrin Falls, R	D. M. McGlenen	E. C. Teare
Chardon, A	W. R. Davis	Jessie King
Chillicothe, A	M. E. Hard	W. H. Rice
Cincinnati—	F. B. Dyer	
Hughes, A		E. W. Coy
Walnut Hills, A		W. T. Harris
Woodward, A		E. D. Lyon
Cin. Tech. School, A		F. M. Ballou
Circleville, A	C. L. Boyer	T. Otto Williams
Cleveland—	W. H. Elson	
Central, A		Edward L. Harris
East, A		B. U. Rannells
Lincoln, A		James W. McLane
South, A		G. A. Reutenik
West, A		C. L. Lynch
Glenville, A		H. H. Cully
Clintonville, R	S. T. Price	W. S. Jennings
Clyde, A	Arthur H. Wicks	Lela B. Gilbert
Collinwood, A	Frank P. Whitney	F. C. Rulon
Columbus—	Jacob A. Shawan	
Central, A		W. M. Townsend
East, A		F. B. Pearson
North, A		C. D. Everett
South, A		C. S. Barrett
Columbus School for		Miss G. L. Jones
Girls, A		Miss Alice Gladden
Columbus Grove, R	J. T. Begg	
Conneaut, R	Calvin T. Northrop	Louise E. Kahler
Corning, R		
Coshocton, A	Herman S. Piatt	W. L. Richer
Covington, R	L. J. Bennett	D. H. Sellers
Cumberland, R	G. E. Bell	W. S. Kingston
Cuyahoga Falls, R		Clinton Stauffer
Dayton, A	J. W. Carr	Chas. L. Loos, Jr.
Defiance, R	F. E. Reynolds	
Delaware, A	W. McK. Vance	Maude I. Myers
Delta, R	G. W. Hoffman	Viola Wilkins
DeGraff, R	N. H. Stull	
Dennison, R	W. H. Angel	A. J. Fry
East Cleveland, A	W. H. Kirk	
East Liverpool, A	R. E. Rayman	Florence Updegraff
Eaton, A	J. R. Beachler	John O'Leary
Elyria, A	W. R. Comings	H. M. Ebert
Euclid, R	H. D. Rankin	Mary E. Gould
Findlay, A	J. W. Zeller	J. F. Smith
Fort Recovery, R	James Ross	(Mrs.) J. A. Hunter
Fostoria, A	S. H. Layton	Ida McDermott
Fremont, A	J. E. Collins	E. A. Seibert
Friends' Boarding		
School (Barnes-		
ville), R		B. J. Thomas

School	Superintendent	Principal
Galion, A	I. C. Guinther	Louise John
Gallipolis, A	H. E. Conard	Morris A. Henson
Garrettsville, R	E. F. Robison	
Geneva, R		
Georgetown, A	A. F. Waters	Susan Cockerill
Germantown, A	C. W. McClure	S. M. Heitz
Glendale, A	E. H. Foster	
Grand River Institute, A		O. J. Luethi
Granville, R	Lee W. McKinnon	Flora Hoover
Greenfield, A	Frank S. Alley	Roy Harris
Greenville, A.	W. S. Rowe	J. L. Selby
Grove City, R	A. C. Fries	C. F. Neiswander
Groveport, R	W. E. Sealock	Jennie Lewis
Hamilton, A	Darrell Joyce	W. P. Cope
Harmony Township (Clark Co.), R	David Neer	Carlton Henry
Hartwell, A	J. S. Trisler	J. C. Mauckley
Harrison, R	Thos. P. Pierce	Mary A. Curran
Highland, R	C. W. Johnson	Bessie L. Smith
Hillsboro, A	F. H. Warren	W. E. Arter
Home City, R	J. O. Falkenburg	Inez M. White
Ironton, A	S. P. Humphrey	T. Howard Winters
Jackson, A	J. E. Kinnison	J. C. Boyd
Jefferson, A	H. S. Foote	Mary I. Hoskins
Kent, R	A. B. Stutzman	Amy Herriff
Kenton, A	N. E. Hutchinson	H. E. Giles
Kingsville, R	P. S. Kingsbury	
Kirtland, R	E. L. Beck	
Lakeside, A	J. E. Ockerman	
Lakewood, A	J. M. H. Frederick	H. W. Kennedy
Lancaster, A	H. A. Cassidy	
Lebanon, R	J. M. Hamilton	L. F. Coleman
Leetonia, R	J. W. Moore	Wynonah Thompson
Leipsic, R	W. S. Sackett	Florence B. McClure
Lima, A	J. A. Davidson	S. Steffens
Lisbon, R	W. O. Lambert	W. C. Dyer
Lockland, A	S. T. Dial	Howard Hollenbach
Logan, A	H. F. Silverthorn	Katherine A. Bowlby
London, A	Wm. McClain	Marion Schlesinger
Lorain, R	A. C. Eldredge	D. J. Boone
Madison, R	Geo. C. Von Beseler	Lois Ellet
Madison Township (Pickaway Co.), R		
Madisonville, A	C. M. Merry	(Mrs.) J. M. Bryan
Mad River Township (Enon Village), R	J. R. Clark	O. P. Hause
Malta, R	John B. Conrad	(Mrs.) E. W. Bradley
Mansfield, A	Chas. L. Van Cleve	Harland E. Hall

School	Superintendent	Principal
Marietta, A	J. V. McMillan	C. E. Reed
Marion, A	H. L. Frank	F. D. Tubbs
Martins Ferry, A	F. W. Wenner	H. W. Paxton
Marysville, A	L. B. Demorest	Wm. I. Hill
Massillon, R	C. L. Cronebaugh	L. S. Hopkins
Mechanicsburg, A	W. T. Trump	J. W. Bowen
Medina, A	J. R. Kennon	Fannie E. Thomson
Miamisburg, A		Hardy Jackson
Middletown, A	Arthur Powell	Geo. C. Stahl
Mt. Sterling, R	T. F. Leonard	Cathryn Webber
Mt. Vernon, A	J. S. Alan	R. E. Offenhauer
Napoleon, R	P. C. Zemer	F. W. Leist
Nelsonville, A	Aaron Grady	O. C. Jackson
Newark, A	J. D. Simkins	Edward P. Childs
New Bremen, R	C. F. Limbach	J. O. Erwin
New Lexington, R	J. M. Gordon	G. A. Elliot
New London, A	W. H. Mitchell	Stella M. Townsend
New Lyme Insti- tute, A		H. C. White
New Philadelphia, A	G. C. Mauer	G. A. Wyly
New Richmond, R		
New Vienna, R	W. C. Hutchinson	
Niles, R	F. J. Roller	W. H. C. Newington
North Baltimore, R	B. O. Martin	S. L. Eby
Norwalk, R	A. D. Beechy	James E. Cole
Norwood, A	W. S. Cadman	W. W. McIntire
Oak Harbor, R	H. H. Hoffman	(Mrs.) Sarah R. Gill
Oberlin, A	Ward Nye	Howard L. Rawdon
Oberlin Academy, A		J. F. Peck
Orrville, R		
Osborne, R	A. F. Darby	
Ottawa, R	G. J. Keinath	
O. S. & S. O. Home, R	E. L. Mendenhall	
Painesville, A	F. H. Kendall	A. H. Mabley
Pandora (Riley Township), R	P. D. Amstutz	C. E. Steiner
Perrysburg, R	C. E. Stinebaugh	Olive Woodard
Piqua, A	C. W. Bennett	F. E. C. Kirkendall
Plain City, R	J. S. Edwards	
Pleasant Ridge, R	F. L. Simmerman	
Pomeroy, R	C. T. Coates	Dollie Hooper
Port Clinton, R	C. S. Wheaton	Lillian C. Smith
Portsmouth, A	J. I. Hudson	Frank Appel
Quaker City, R	W. G. Wolfe	J. O. Eagleson
Ravenna, R	E. O. Trescott	W. J. Dodge
Reynoldsburg, R	Arthur L. Gantz	Wm. S. Coy
Richwood, R	Forest B. Bryant	W. E. Shrader
Ripley, R	R. B. Smith	John W. Thalman
Sabina, R	M. J. Flannery	T. C. Madden
Salem, A	J. S. Johnson	B. F. Stanton
Salineville, R	Frank Linton	W. H. Hannum

School	Superintendent	Principal
Sandusky, R	H. B. Williams	Geo. C. Dietrich
Shelby, A	S. H. Maharry	C. H. Winans
Sidney, A	Herbert R. McVay	Lee R. Dollenger
Solon, R	U. S. Earls	Charlotte Parker
Somerset, R	J. W. Davis	E. R. Beck
South Charleston, R		Stanley Zemer
Spencerville, R	Thos. J. Class	E. S. Bolton
Springfield, A	Carey Bogess	C. C. Patterson
Steubenville, A	E. M. Van Cleye	W. H. Maurer
St. Mary's, A	E. A. Hotchkiss	
St. Paris, R	D. C. Bryant	Florence Hunter
Tiffin, A	C. A. Krout	H. H. Frazier
Tippecanoe City, R	Orville Crist	E. R. Rike
Toledo, A	H. J. Eberth	Wm. B. Guitteau
Troy, A	C. W. Cookson	G. F. M. Mark
Uhrichsville, R	L. E. Everett	C. W. Jackson
Union City (Ind.), A		
Urbana, A	I. N. Keyser	H. N. Morton
Upper Sandusky, R	R. J. Kiefer	H. D. Mulholland
Utica, R	F. P. Householder	
Van Wert, A	J. P. Sharkey	Orrin Bowland
Wadsworth, R		W. A. Franks
Wapakoneta, R	H. H. Helter	Mary O. Conrath
Warren, A	C. E. Carey	F. E. Ostrander
Washington C. H., A	James T. Tuttle	D. L. Thompson
Wauseon, A	C. J. Biery	H. O. Hannah
Wellington, A	R. H. Kinnison	Elizabeth Day
Wellston, A	E. S. McCall	J. W. Whiteside
Wellsville, A	J. L. MacDonald	Ruby C. Mason
West Jefferson, R	L. C. Dick	
West Milton, R	F. B. Harris	Mary E. Thomas
West Unity, R	W. A. Salter	Adah Weiser
Willoughby, R	S. D. Shankland	Edward M. Ottis
Woodsfield, R	C. S. McVey	
Wooster, A	Chas. Hauptert	Laura B. Kean
Worthington, R	Harvey S. Gruener	J. J. McDonald
Wyoming, A	C. S. Fay	Evelyn M. Prichard
Xenia, A	Edwin B. Cox	Geo. J. Graham
Youngstown, A	N. H. Chaney	Wells L. Griswold
Zanesville, A	W. D. Lash	Ira C. Painter

A large number of schools of other States are on the accredited list of the University and applicants presenting certificates from schools outside of Ohio must see that the certificates furnish the details of work done in accordance with the regulations specified on page 10.

COURSES OF STUDY

AGRICULTURE

The course in Agriculture is one of a number of regular four-year collegiate courses in the University. It is designed not only to make specially trained agriculturists, but also educated men. The course pre-supposes that a young man has had a High School training, or its equivalent, and that he has had the training in farm matters that usually comes to a young man who has lived on a farm. It supplements this training but does not repeat it. The technical training in this course consists of those matters which years of experience in teaching have shown are either lacking or most necessary. Young men from the cities are entering this course, as they should do if they expect to engage in agricultural pursuits, but it should be understood that the course in Agriculture does not, except incidentally, supply that training in farm matters which comes from actual life upon the farm. Such a course could be readily planned, but it would waste the valuable time of nine-tenths of the students who now enter the course.

The officers of the College recognize the danger of a too special or technical training of under-graduate students in a subject having such a wide scope and one requiring for its successful prosecution such breadth of knowledge as Agriculture. A careful examination of the course as outlined will show that about one-third of the time of the student during the four years is, or may be, devoted to language (English and foreign), history, and economics, about one-third to pure science, and one-third to technical or professional training. Electives in the senior year allow the student, if he chooses, to specialize in Animal Husbandry, Agronomy, Dairying, Rural Economics, or Agricultural Chemistry.

No man or woman is well educated until he or she has been taught both to do and to think. Both faculties are necessary and each assists the other. Experience and reason, however, show that the students who enter the course

in Agriculture have been better trained in doing than in thinking. With them manual training is not as necessary as an educational factor as with students from the cities. However, special emphasis is laid on training the faculties of observation, reason, and judgment. The laboratory methods and facilities are most thorough and complete in all scientific and technical courses, giving a training which is impossible to obtain merely from books.

COURSE IN AGRICULTURE

Degree—Bachelor of Science in Agriculture.

NOTE:—The figure in parenthesis following the name of each subject indicates the number of that subject in its department, the other figure the number of credit hours.

FIRST YEAR

FIRST TERM		SECOND TERM		THIRD TERM	
Chemistry (7 or 44)	4.	Chemistry (7 or 44)	4.	Chemistry (12)	4.
Inorganic.		Inorganic.		Qualitative.	
Zoology (1)	3.	Zoology (1)	3.	Chemistry (42)	2.
Invertebrate.		Invertebrate.		Organic.	
English (1)	2.	English (1)	2.	Zoology (1)	3.
Paragraph Writing.		Paragraph Writing.		Vertebrate.	
*French (1)		French (1)		English (1)	2.
German (1) or		German (1) or		Paragraph Writing.	
Spanish (1)	4.	Spanish (1)	4.	French (1)	
Drawing (10)	3.	Shopwork (2)	3.	German (1) or	
Cadet Service.		Gymnasium.		Spanish (1)	4.
				Shopwork (1)	3.
				Cadet Service.	

SECOND YEAR

FIRST TERM		SECOND TERM		THIRD TERM	
An. Husbandry (2)	4.	An. Husbandry (6)	4.	An. Husbandry (4)	4.
Breeds of Live Stock.		Principles of		Breeds of Live Stock.	
Agr. Chem. (13)	5.	Breeding.		Agr. Chem. (13)	5.
Botany (6)	4.	Agr. Chem. (13)	5.	Botany (8)	4.
Physiology (1)	3.	Botany (7)	4.	Physiology (1)	3.
Zoology (4)	3.	Physiology (1)	3.	Zoology (4)	3.
Economic.		Zoology (4)	3.	Economic.	
Cadet Service.		Economic.		Cadet Service.	
		Gymnasium.			

THIRD YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Agronomy (2) Farm Equipment.	4. Geology (5) Applied.	4. Agronomy (22) Crops.
Geology (2) General.	5. †Vet. Med. (29) General Pathology.	4. Agronomy (12) Soils.
†Vet. Med. (28) Anatomy.	4. Horticulture (6) An. Husbandry (8) Feeding.	4. †Vet. Med. (30) Special Pathology.
Horticulture (1)	4. Astronomy (3) Meteorology.	4. Horticulture (3)

FOURTH YEAR

FIRST TERM	SECOND TERM	THIRD TERM
REQUIRED.		
Am. History (1) or U. S. Political.	Am. History (1) or U. S. Political.	Am. History (1) or U. S. Political.
Economics (33) Political Economy.	3. Economics (33) Political Economy.	3. Economics (33) Political Economy.
Thesis	2. Thesis	2. Thesis

Eight hours per week through the year, chosen from any of the following courses:

Agronomy (14) Advanced Soils.	5. Agronomy (24) Agricultural Experimentation.	4. Agronomy (4) Rural Engineering.	5.
Agronomy (27) Grasses and Forage Crops.	3. Rural Econom. (4) History and Litera- ture of Agriculture.	3. Agronomy (26) Improvement of Farm Crops.	3.
Agronomy (23) Seed and Market Grains.	2. An. Husbandry (10) Hygiene and Management.	3. Agronomy (16) Field Work in Soils.	3.
Rural Econom. (2) Farm Management.	4. An. Husbandry (16) Wools and Other Fibers.	4. Rural Econom. (6) Live Stock Markets and Commerce.	4.
An. Husbandry (12) Advanced Stock Judging.	4. An. Husbandry (20) Meat and Meat Products.	2. An. Husbandry (21) Harness and Vehicle.	2.
An. Husbandry (19) The Education of the Horse.	2. Dairying (16) Cheesemaking.	1. An. Husbandry (22) Biographical Studies of Master Breeders.	1.
An. Husbandry (23)	4. Adv. Dairying (23)	4. An. Husbandry (24) Market Classes of Horses and Swine.	4.
Dairying (12) Elements.	5. Vet. Med. (18) Surgical Diseases.	3. An. Husbandry (24) Adv. Dairying (23) Buttermaking.	4.
Dairy Mech. (22)	3. Bacteriology (5)	3. Dairying (14)	5.
Vet. Med. (24) General Surgery.	3. Agr. Chem.	3. Vet. Med. (18) Surgical Diseases.	3.
Bacteriology (5)	4.	4. Bacteriology (5)	4.
Agr. Chem.	3 to 5.	4. Agr. Chem.	3 to 5.

ELECTIVE

Four hours a week through the year, chosen from any of the courses given in any of the colleges of the University upon which the student is qualified to enter, except the College of Law.

*Where credit is received for Elementary French, German or Spanish, French (2) 4 hours, German (4) 4 hours, or Spanish (2) 4 hours is required.

†A student may substitute for Veterinary Medicine (28) (29) and (30) an equal number of hours throughout the year from courses offered in Agricultural Chemistry, Dairying, Entomology, or Animal Husbandry.

HORTICULTURE AND FORESTRY

This course was established to meet a growing demand for special education and training in the College of Agriculture. It seeks to familiarize the student with those sciences that are fundamental in Horticulture and Forestry and to give a certain amount of technical and literary training.

Among the sciences that form the natural basis of a sound, practical knowledge of Horticulture and Forestry are chemistry, physics, botany, geology, zoology, and entomology. To these a large part of the first two years of the course is devoted. In addition, one modern language, rhetoric or English composition, drawing and shopwork are required.

The last two years of the course are devoted mainly to Horticulture and Forestry proper, with some more strictly cultural studies like history or economics. A third part of the required work of the fourth year is elective, and may be chosen from any course in the University upon which the student is qualified to enter.

The primary object of the course is to teach those who desire to become fruit-growers, gardeners, nurserymen, florists, or foresters what they most need to know as a foundation for their professional work. To this end both the science and art, or the theory and practise are taught. While the sciences are invaluable in giving accurate and definite knowledge regarding the origin and growth of plants, and

the composition and physical properties of the soil, they cannot tell us just how to select varieties, or how to propagate, transplant, cultivate, fertilize, prune, spray, or what is equally essential in practise, how to harvest, store and market the product to the best advantage.

For earnest, enterprising young men and women, Horticulture and Forestry, in their various branches, offer as large a reward for intelligent, well-directed effort as any other pursuit or profession. Forestry presents an especially inviting field for young men.

Over one-half of the students who have graduated in this course, since its establishment about twelve years ago, are filling positions of honor and responsibility that command salaries ranging from fifteen hundred to two thousand dollars a year. One-half of the remainder, including some of the more recent graduates, are receiving salaries of one thousand dollars or more a year.

COURSE IN HORTICULTURE AND FORESTRY

Degree—Bachelor of Science in Horticulture and Forestry.

NOTE:—The figure in parenthesis following the name of each subject indicates the number of that subject in its department.

FIRST YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Chemistry (7 or 44) Inorganic.	5. Chemistry (7 or 44) Inorganic.	5. Chemistry (12) Qualitative.	4.
Zoology (1) Invertebrate.	3. Zoology (1) Invertebrate.	3. Chemistry (42) Organic.	2.
English (1) Paragraph Writing.	2. English (1) Paragraph Writing.	Zoology (1) Vertebrate.	3.
*French (1) German (1) or Spanish (1)	French (1) German (1) or Spanish (1)	English (1) Paragraph Writing.	2.
Drawing (10)	4. Shopwork (2) Gymnasium.	French (1) German (1) or Spanish (1)	4.
Cadet Service.	3. Shopwork (2) Gymnasium.	3. Spanish (1) Shopwork (1) Cadet Service.	4. 3.

SECOND YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Horticulture (1) Elements.	4. Horticulture (2) Vegetable Forcing.	4. Horticulture (3) Plant Propagation.
Agr. Chem. (13)	5. Agr. Chem. (13)	5. Agr. Chem. (13)
Physiology (1)	3. Physiology (1)	3. Physiology (1)
Zoology (4) Economic	3. Zoology (4) Economic	3. Zoology (4) Economic
Botany (6)	4. Botany (7)	4. Botany (8)
Cadet Service.	Gymnasium.	Cadet Service.

THIRD YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Horticulture (5) Varieties of Fruit.	4. Horticulture (6) Principles of Fruit Culture.	4. Horticulture (14) Olericulture.
Agronomy (2) Farm Equipment.	4. Geology (5) Applied.	4. Agronomy (22) Crops.
Geology (2) General.	5. Horticulture (18) Apiculture.	4. Agronomy (12) Soils.
French (2)		3. Zoology (3) Economic
German (4)	French (2)	French (2)
Spanish (2) or Botany (17) Forestry.	4. German (4)	German (4)
	4. Spanish (2) or Botany (18)	4. Spanish (2) or Botany (19)
	4. Histology of Wood.	4. Forest Ecology and Pathology.

FOURTH YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Horticulture (8) Ornamental Plants.	2. Horticulture (9) or Window Gardening and Floriculture.	Horticulture (10) Home Gardening.
Horticulture (11) Elements of Forestry.	5. Horticulture (17) Plant Variation.	Horticulture (15) Landscape Gardening.
Am. History (1) or Political.	Horticulture (12) Forest Technology and Timber Physics.	5. or Hortic. (13) Forest Economics.
Economics (33) Political.	3. Am. History (1) or Political.	Am. History (1) or U. S. Political.
Thesis	2. Economics (33) Political.	Economics (33)
	Thesis	Thesis

ELECTIVE

Five hours a week through the year, chosen from any of the courses given in any college of the University upon which the student is qualified to enter, except the College of Law.

*Where credit is given for Elementary French, German or Spanish, French (2) 4 hours, German (4) 4 hours, or Spanish (2) 4 hours is required.

TWO-YEAR COURSE IN AGRICULTURE

The Short Course in Agriculture is a two-year course, the first year of which is made up largely of studies preparatory either to the second year of the short course or the first year of the four-year course in Agriculture or in Horticulture and Forestry. While believing that the four-year course is none too long for the students who expect to engage in agricultural pursuits, yet it is recognized that there are many students whose circumstances make it impossible to take a four-year collegiate course in Agriculture, and yet who would be greatly benefited by taking a less extended training for their life work.

This course is especially desirable for students of rather mature age. It contains as thorough instruction as the time will admit in Agriculture, Animal Husbandry, Dairying, Horticulture (including Fruit Culture, Vegetable Gardening, and Forestry), Veterinary Medicine, Economic Entomology, Bacteriology, and the sciences underlying these subjects. The second year contains optional work so that it is possible for students to specialize in Horticulture, Agronomy, Animal Husbandry, or Dairying.

No degree is given on the completion of the work, but a certificate is issued stating fully the work done.

OUTLINE OF TWO-YEAR COURSE IN AGRICULTURE

FIRST YEAR

NOTE:—The figure in parenthesis following the name of each subject indicates the number of that subject in its department.

FIRST TERM	SECOND TERM	THIRD TERM
Chemistry (3)	4. Chemistry (3)	4. Chemistry (45) 4.
Mathematics (1) Algebra.	5. Chemistry (43) Organic.	1. Agr. Chem. (16) 2. Applications.
Physics (1) Elementary.	5. Mathematics (3a) Geometry.	5. Botany (1) 5. Elementary.
Drawing (10) Mechanical.	3. Physics (1) Elementary.	5. Geology (1) 5. Physiography.
Cadet Service.	Shopwork (1) Gymnasium.	Shopwork (2) 3. Cadet Service.

SECOND YEAR

Not less than fifteen hours per week through the year, chosen from any of the following courses:

FIRST TERM	SECOND TERM	THIRD TERM
An. Husbandry (1) Breeds of Live Stock.	4. An. Husbandry (3) Stock Feeding.	3. An. Husbandry (5) 4. Principles of Breeding.
Agronomy (2) Farm Equipment.	4. Agronomy (11) Soils.	4. Agronomy (22) 4. Crops.
Dairying (12) Elements.	5. Dairying (14) Buttermaking.	5. Dairying (16) 5. Cheesemaking.
Horticulture (1) Elements.	4. Horticulture (6) Principles of Fruit Growing.	4. Horticulture (3) 4. Plant Propagation.
Vet. Med. (28) Anatomy.	4. Vet. Med. (29) General Pathology.	4. Vet. Med. (30) 4. Special Pathology.
Physiology (2)	3. Bacteriology (2) Gymnasium.	2. Zoology (7) 3. Cadet Service.
Cadet Service.		

WINTER COURSES

SPECIAL WINTER COURSE IN DAIRYING (Known as the Ohio State Dairy School.)

This Course in Dairying is established to meet the wants of those who have neither the time nor means for more extended courses. It is designed especially for those who are desirous of mastering the art of butter and cheese making or who wish to become fitted for the position of manager or superintendent of a creamery or cheese factory. In this course the greater part of the time is given to the laboratory or dairy room practise. This consists in the testing of milk as to purity and content of butter fat; the use and care of centrifugal separators and other dairy devices; the making of butter and cheese by the most improved methods; in short, all the essential operations of the creamery, factory, and home dairy management are repeatedly performed under the guidance and direction of competent instructors. A special bulletin describing this course will be mailed upon application to anyone interested.

WINTER COURSE IN AGRICULTURE

The ten weeks Winter Course in Agriculture has been established to meet the needs of those Ohio farmers who are unable to avail themselves of the other courses in agriculture offered by the University. There are a large number of young men located on the farms of our state who are so situated that it is impossible for them to be absent from their homes during the nine months of the college year, but yet desire some training in the principles of agriculture. On other farms are found mature men, who are past the usual school age but are ambitious to become familiar with the most recent agricultural thought and practises.

This course offers to such men an opportunity to become familiar with the results of the latest investigations in agriculture and to study the theories resulting from this research and their practical application to work on the farm.

Those interested are invited to write for the special announcement describing this course.

DOMESTIC SCIENCE

This department has three purposes: The first is to offer to those young women who look forward to teaching, or to other professional work, the opportunity to take a four-year course in Domestic Science and Domestic Art, leading to the degree of Bachelor of Science in Domestic Science; the second is to offer a short course to those young women who can give but a limited time to university training and who desire to study the rational and scientific administration of the home; the third is to offer certain elective courses which shall be available as a part of the general education of all young women.

The courses are planned for no one class of women, but in the hope that they may appeal to the most womanly side of all women. The desire is that by the practical and scientific study of the problems of right living, women shall come to see more in household administration than mere routine; to recognize that economics has its foundation in home and institutional relations; that science is of great importance in all that pertains to home economics; that art and ethics have no higher use than to purify and beautify every-day subjects; and that the history and literature of the past have direct bearing upon the present.

Special work in the Domestic Science Department is given in thirteen courses. Of these, four are devoted to the practical and scientific aspect of the food problem, one to household economics and sanitation, one to therapeutic diet and emergency work, one to the theory and practise of teaching Domestic Science, one to hand craft, one to history of costume, one to household art and decoration, one to the theory and practise of teaching Domestic Art, and one to seminary work. All of the above courses are required in the four-year course, except the seminary course, which is elective. The first three courses of the study of foods, one course of handcraft, two courses in textile work are required in the Short Course. Household economics and sanitation are elective in the Short Course.

OUTLINE—FOUR-YEAR COURSE.

Degree—Bachelor of Science in Domestic Science.

NOTE:—The figure in parenthesis following the name of each subject indicates the number of that subject in its department.

FIRST YEAR

FIRST TERM		SECOND TERM		THIRD TERM	
Chemistry (7 or 44)	4.	Chemistry (7 or 44)	4.	Chemistry (12)	4.
Inorganic.		Inorganic.		Qualitative Analysis.	
Drawing (29)	1.	Drawing (29)	1.	Chemistry (42)	2.
English (1)	2.	English (1)	2.	Organic.	
Paragraph Writing.		Paragraph Writing.		Drawing (29)	1.
Zoology (1)	3.	Zoology (1)	3.	English (1)	2.
Invertebrate.		Invertebrate.		Paragraph Writing.	
*French (1)		French (1)		Zoology (1)	3.
German (1) or		German (1) or		Vertebrate.	
Spanish (1)	4.	Spanish (1)	4.	French (1)	
Domestic Art (1)	2.	Domestic Art (2)	2.	German (1) or	
Hand Craft.		Textiles.		Spanish (1)	4.
Hygiene and Physical		Hygiene and Physical		Domestic Art (3)	2.
Training.		Training.		Textiles.	
				Hygiene and Physical	
				Training.	

SECOND YEAR

FIRST TERM		SECOND TERM		THIRD TERM	
Agr. Chem. (14)	5.	Agr. Chem. (14)	5.	Physiology (3)	3.
Dom. Science (1)	5.	Dom. Science (2)	5.	Chemical.	
Food Economics.		Food Economics.		Dom. Science (3)	5.
Physiology (1)	3.	Physiology (1)	3.	Food Economics.	
Botany (6)	5.	Botany (7)	4.	Physiology (1)	3.
Hygiene and Physical		Hygiene and Physical		Botany (13)	4.
Training.		Training.		Hygiene and Physical	
				Training.	

THIRD YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Dom. Science (4) 5. Preservation of Foods.	Domestic Art (4) 4. History of Costume.	Domestic Art (5) 5. Household Art and Decoration.
Drawing (20) 1. Mechanical.	Drawing (15) 1½. Technical.	Drawing (15) 1½. House Designing.
French (2)	French (2)	French (2)
German (4) or Spanish (2)	German (4) or Spanish (2)	German (4) or Spanish (2)
Education (1) 3. Psychology.	Education (1) 3. Psychology.	Education (1) 3. Psychology.

Not less than three hours from the following:

Architecture (9) 3. History of Architecture.	Architecture (10) 3. History of Architecture.	Architecture (11) 3. History of Architecture.
English (8) 3.	English (8) 3.	English (8) 3.
Economics (33) 3. Political Economy.	Economics (33) 3. Political Economy.	Economics (33) 3. Political Economy.
European His. (1) 3.	European His (2) 3.	European His. (3) 3.
Am. History (1) 3. U. S. Political.	Am. History (1) 3. U. S. Political.	Am. History (1) 3. U. S. Political.
Bacteriology (5) 4.	Bacteriology (5) 4.	Bacteriology (5) 4.
Drawing (14) 2. Pen Drawing.	Drawing (18) 3. Water Color.	Drawing (19) 2. Water Color.
Drawing (17) 2. Art (10) 2.	Drawing (40) 2. Clay Modeling.	Drawing (41) 2. Clay Modeling.
	Art (11) 2.	Art (12) 2.

FOURTH YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Domestic Art (6) 3. Theory and Practise of Teaching.	Dom. Science (11) 3. Therapeutic Diet and Emergency Work.	Dom. Science (12) 3. Theory and Practise of Teaching.
Thesis 2.	Thesis 2.	House. Eco. (10) 2. Thesis 2.

ELECTIVE

Ten hours a week through the year, chosen from any of the courses given in any college of the University upon which the student is qualified to enter, except the College of Law.

*Where credit is received for elementary French, German, or Spanish, French (2) 4 hours, German (4) 4 hours or Spanish (2) 4 hours is required.

SHORT COURSE

NOTE:—The figure in parenthesis following the name of each subject indicates the number of that subject in its department.

FIRST YEAR

FIRST TERM.		SECOND TERM.		THIRD TERM.	
Chemistry (3) Inorganic.	4.	Chemistry (3) Inorganic.	4.	Chemistry (45) Qualitative Analysis.	4.
Physics (1) Elementary.	5.	Physics (1) Elementary.	5.	Chemistry (42) Organic.	2.
French (1) German (1) or Spanish (1)	4.	French (1) German (1) or Spanish (1)	4.	Botany (1) Elementary.	5.
Drawing (29)	1.	Drawing (29)	1.	French (1) German (1) or Spanish (1)	4.
Hygiene and Physical Training.		Hygiene and Physical Training.		Drawing (29)	1.

SECOND YEAR

FIRST TERM		SECOND TERM		THIRD TERM	
Domestic Art (1) or Dom. Sci. (1)	2. 5.	Domestic Art (2) or Dom. Sci. (2)	2. 5.	Domestic Art (3) or Dom. Sci. (3)	2. 5.

ELECTIVE

Not less than ten hours per week if Domestic Science is selected, or twelve hours if Domestic Art is taken from the following list of studies:

Drawing (20)	1½.	Drawing (15)	1½.	Drawing (15)	1½.
Botany (6) Physiological.	4.	Botany (7) Economic.	4.	Botany (13) Household.	4.
Education (1) Psychology.	3.	Education (1) Psychology.	3.	Education (1) Psychology.	3.
English (8)	3.	English (8)	3.	English (8)	3.
Horticulture (8) Elements of Floriculture.	2.	Horticulture (9) Window Gardening.	2.	Horticulture (10) Home Gardening.	2.
Zoology (1) Invertebrate.	3.	Zoology (1) Invertebrate.	3.	Zoology (1) Vertebrate.	3.
English (1) Paragraph Writing.	2.	English (1) Paragraph Writing.	2.	English (1) Paragraph Writing.	2.
Physiology (1)	3.	Physiology (1)	3.	Physiology (1)	3.
European His. (1)	3.	European His. (2)	3.	European His. (3)	3.
Am. History (1)	3.	Am. History (1)	3.	Am. History (1)	3.

DEPARTMENTS OF INSTRUCTION

AGRICULTURAL CHEMISTRY

(Townshend Hall.)

PROFESSOR WEBER, PROFESSOR VIVIAN, MR. CALL, MR. RAMSOWER.

The department of Agricultural Chemistry occupies the greater part of the second floor of Townshend Hall. The main students' laboratory is at present fitted up with one hundred and fifty desks, and will accommodate over two hundred students. Each desk contains a complete outfit of apparatus and chemicals necessary for the work in hand. Special apparatus and chemicals are supplied from the store room. Each desk is supplied with gas and water. Hoods for evaporation and generation of noxious gases and liquids are conveniently arranged on both sides and one end of the laboratory. From the main laboratory, easy access is had to the balance room and private laboratory of the instructor on one side and to the organic analysis and assistant's room and storeroom on the other. A room entirely detached from the main laboratory is fitted up for water analysis and for the polariscopic determination of sugar. The lecture room is capable of seating one hundred and fifty students. In connection with it is a preparation room, which is supplied with the necessary apparatus and specimens for illustrating the lectures.

13. GENERAL AGRICULTURAL CHEMISTRY. Five credit hours. Three terms. Prerequisite, Chemistry, 7, 12, and 42. *Tu., Th., at 9. Laboratory, M., Th., or Tu. F., 1 to 4.* Professor VIVIAN.

Two lectures and three laboratory periods weekly. Lectures on chemistry as applied to agriculture, including the following topics: Food requirements of plants, sources of plant food, soil exhaustion, and amelioration, barnyard manures and commercial fertilizers, composition of feeding stuffs and dairy products. Laboratory work consists of a brief introduction to quantitative analysis, gravimetric and volumetric, followed by the analysis of fertilizers, feeding stuffs, and dairy products.

14. DOMESTIC SCIENCE CHEMISTRY. Five credit hours. Course in Domestic Science, first and second term. Prerequisite Chemistry,

7, 12, and 42. *M., F., at 9.* Laboratory, *M., Th., or F., 1 to 4; S., 8 to 11.* Professor VIVIAN.

Lectures on household chemistry. Laboratory work consists of a brief introduction to quantitative analysis, followed by the analysis of foods and other materials of household interest.

15. INDUSTRIES RELATED TO AGRICULTURE. Four credit hours. Three terms. Prerequisite, Course 13, or an equivalent preparation in quantitative analysis. Time to be arranged. Professor WEBER.

Lectures on the manufacture of sugar from cane, sorghum, and beets; the manufacture of starch, glucose, and dextrine; the nature and production of fruit, malt, and distilled vinegars; the manufacture of alcohol, malt liquors, and wines. Laboratory practise consists of the analysis of sugar, syrup, and sugar producing plants; determination of cane sugar and milk sugar by means of the polariscope; the analysis of flours and starches; analysis of vinegars and spirituous and fermented liquors.

16. APPLICATION OF CHEMISTRY TO AGRICULTURE. Two credit hours. Short Course in Agriculture, third term. *Tu., Th., at 10.* Professor VIVIAN.

Lectures and recitations embrace the following topics: Ingredients of plants, organic and inorganic, essential and non-essential; sources of plant food, air and soil; nature of soil, mechanical portion, nutritive portion, assimilable and reserve plant food; soil exhaustion and amelioration; barnyard manure, its sources, composition, and preservation, commercial fertilizers, their rational use and methods of determining the needs of soils.

17. ADVANCED AGRICULTURAL ANALYSIS. Five credit hours. Three terms. Prerequisite, Course 13. Professor WEBER.

The work of this course consists of a detailed study of the official methods of determining nitrogen, potash, phosphoric acid: the complete analysis of grains and feeding stuffs, milk, butter, and cheese. Intended for students desiring to specialize in agricultural chemistry.

18. FOOD INSPECTION AND ANALYSIS. Three to five credit hours. Three terms. Prerequisite, Course 13, or an equivalent preparation in quantitative analysis. Professor WEBER.

Lectures on composition of foods and food adulteration. Laboratory practise embraces the analysis of foods, tea, coffee, syrups, spices, condiments, flavoring extracts, baking powder; sanitary analysis of water; analysis of fats and oils, etc., and the examination of the same for adulteration. This course is designed to prepare for

the analytical work connected with the state control of the sale of food stuffs, etc.

19. DAIRY CHEMISTRY. Three to five credit hours. Three terms. Prerequisite, Course 13. Time to be arranged. Professor VIVIAN.

Lectures on the composition of milk and its products; fermentation, digestion, and decomposition of milk. Laboratory practise on the complete analysis of milk, butter, and cheese; determination of the chemical and physical constants of butter fat; determination of the different proteids of milk and a study of their cleavage products; effect of treatment of dairy products on their chemical composition as shown by analysis, etc. Intended for students specializing in dairying and should be accompanied or preceded by a course in dairying.

20. CHEMISTRY OF SOILS. Three to five credit hours. Three terms. For students specializing in Agronomy. Prerequisite, Course 13. Time to be arranged. Professor WEBER.

Lectures and laboratory work on the chemical composition of the soil, using the official method of analysis of soils, and the various methods suggested by the U. S. Department of Agriculture; testing needs of soils for application of commercial fertilizers.

21. ADVANCED HOUSEHOLD CHEMISTRY. Three to five credit hours. Three terms. Prerequisite, Course 14. Time to be arranged. Professor WEBER.

A study of the composition and analysis of foods; the chemistry of cookery and changes during cooking, as shown by analysis; the examination of cleaning materials, baking powders, the sanitary analysis of water, etc.

22. RESEARCH WORK. Five to ten credit hours. Three terms. Time to be arranged. Professors WEBER and VIVIAN.

AGRONOMY

(Townshend Hall.)

PROFESSOR MCCALL, ASSOCIATE PROFESSOR FOORD.

For the work in farm equipment and rural engineering the department is supplied with apparatus for studying the effect of grade, height of obstruction, height of hitch, size of wheel and weight of load on the draft of wagons. Correct and incorrect methods of constructing and using the double-

tree are studied by means of a large, adjustable model. The draft of vehicles and farm implements is studied by means of a self-registering dynamometer. The agricultural machinery room contains many of the latest models of farm machinery, including binders, mowers, plows, cultivators, and gasoline engines. Several drainage levels and an architect's level are provided for the student's use in running levels and laying out drainage systems. A plane table is used for mapping and laying out fields. A small cement laboratory provides facilities for studying the use of cement and concrete on the farm. A large glass house with its equipment of railroad tracks, trucks, and pots affords opportunity for the study of the adaptability of crops to soils, the fertilizer requirements of different soils and various other problems of crop production. The soils laboratory is provided with apparatus for the study of the physical properties of soils, including specific gravity, the retention of moisture, the effect of mulches on evaporation, the rate of percolation of water through soils and the capillary rise of moisture in soils. The laboratory is also provided with a complete centrifugal outfit for the mechanical analysis of soils, and electrical instruments for determining temperature and soluble salt content.

In the study of crops, use is made of the collection of dried specimens of grasses, grains, and seeds and the growing crops on the farm. The grass garden contains about fifty varieties of grasses and forage crops growing side by side so that a comparative study may be made as to the value of each for pasture, meadow, or hay. A corn-breeding plot gives opportunity for the study of methods of selection and breeding of seed corn.

2. FARM EQUIPMENT. Four credit hours. First term. Prerequisite, Eng. Drawing 10. *M., W., F., at 8; W., or F., 1 to 4.* Professor McCALL.

Lectures and recitations on the selection, laying out, and equipment of the farm, the planning of farm buildings, and a general study of farm power, water supply, and farm machinery. Practicum in the laying out of farms, the planning of farm buildings, compari-

son of farm machines and in the working out of problems in draft and other farm mechanics.

4. RURAL ENGINEERING. Five credit hours. Third term. Prerequisite, Agronomy 2. *Tu., Th., at 9; M., Tu., 1 to 4.* Professor McCALL.

Lectures, recitations, and practicum on (a) Location of farm buildings, and works, the survey and measurement of fields and lots; (b) planning and construction of farm buildings and works, including a study of timber, brick, cement, and other building materials; (c) the laying out and construction of drainage and irrigation systems.

11. ELEMENTARY SOILS. Four credit hours. Second term, short course in Agriculture. *M., W., F., at 8; W., 1 to 4.* Professor McCALL.

Lectures and recitations on the formation and physical properties of our agricultural soils with special reference to methods of management and improvement. Practicum in the laboratory for the study of the relation of soils to air, heat, moisture, and fertilizers.

12. ELEMENTARY SOILS. Four credit hours. Four-year courses in Agriculture and Horticulture and Forestry, third term. *M., W., F., at 11; W., or F., 1 to 4.* Professor McCALL.

Lectures and recitations on the origin, formation and kinds of soils, their chemical and physical composition, and improvement by cultivation, fertilization, drainage, and irrigation. Laboratory studies of the physical properties of soils, the factors which control soil fertility and the method of making mechanical analyses.

14. ADVANCED SOILS. Five credit hours. First term. Prerequisite, Agronomy 11 or 12. *Tu., Th., at 9; M., Tu., 1 to 4.* Professor McCALL.

Lectures and recitations upon the kinds and distribution of soils in the United States, the factors underlying their fertility, and their crop producing power as affected by methods of cultivation and cropping. Special laboratory work will be assigned to each student.

16. FIELD WORK IN SOILS. Three credit hours. Third term. Lecture arranged. *S., 8 to 12.* Professor McCALL.

Lectures on the general character of the more important soils of the United States, methods of establishing soil types, and the adaptability of special crops to the different soil types. Practical work in the mapping of soils in the field, the identification of the soil types, and the preparation of reports.

22. FIELD CROP PRODUCTION. Four credit hours. Third term.

Prerequisite, Botany 1, or its equivalent. *M., W., F., at 8; M., or Tu., 1 to 4.* Associate Professor FOORD.

A brief study of the history, classification, cultivation, harvesting, and marketing of field crops, with special reference to Ohio conditions.

23. SEED AND MARKET GRAIN. First term. Two credit hours. Lectures to be arranged. Practicum, *Tu., 1 to 4.* Prerequisite, Agronomy 22. Associate Professor FOORD.

Seed selection, corn, and small grain judging, and the market grading of grains.

27. GRASSES AND FORAGE CROPS. Three credit hours. First term. Prerequisite, Botany 1, or its equivalent. *M., W., at 9, W., 1 to 4.* Associate Professor FOORD.

A study of the characteristics and habits of growth of the principal grass and forage crops of the United States, with special reference to their adaptability to soil and climatic conditions. The silo and silage crops. Laboratory work in seed testing, both for purity and germination.

24. AGRICULTURAL EXPERIMENTATION. Four credit hours. Second term. Lecture arranged. *M., Tu., 1 to 4.* Associate Professor FOORD.

Lectures upon history and development of experiment stations, methods, and character of station work, and the interpretation of experimental results. Seminars devoted to the study of experiment station literature, and to the methods of experimentation.

26. FIELD CROP IMPROVEMENT. Three credit hours. Third term. Prerequisite, Agronomy 22. *Tu., Th., at 10; W., 1 to 4.* Associate Professor FOORD.

A study of the principles involved and the methods used in the improvement of field crops. The value of selection, cross fertilization and inbreeding of plants.

28. CONSTRUCTION AND SANITATION OF DAIRY BUILDINGS. Two credit hours. Second term. Time to be arranged. Professor MCCALL.

AMERICAN HISTORY AND POLITICAL SCIENCE

(University Hall, Rooms 205 and 410.)

PROFESSOR KNIGHT, ASSISTANT PROFESSOR TUTTLE, MR. PORTER.

AMERICAN HISTORY.

1. POLITICAL HISTORY OF THE UNITED STATES. Three credit hours. Three terms. Thwaite's *The Colonies*; Hart's *Formation*

of the Union; Wilson's Division and Re-union. *M., W., F., 8 or 9.*
 Assistant Professor TUTTLE, MR. PORTER.

A general course in the political history from the earliest colonial times to the present. Text-books, prescribed readings and topical reports. ,

ANATOMY AND PHYSIOLOGY

(Biological Hall, Rooms 12 and 20.)

PROFESSOR BLEILE, DR. SEYMOUR, DR. BEER.

The facilities provided for the study of Anatomy, Histology, and Physiology are good. The laboratory is supplied with skeletons, manikin, and many models of the organs of the body. The apparatus for work in physiology is of good construction and adequate for the performance of fundamental physiological experiments.

For work in Histology the equipment includes fifty individual tables for student work, each one being supplied with a good microscope and the various accessories. The equipment of the laboratories makes it possible to offer work along certain lines to advanced students.

1. HUMAN ANATOMY AND PHYSIOLOGY. Three credit hours. Three terms. Lectures, recitations and laboratory work. This course must be preceded or accompanied by a course in chemistry. *Sec. I, M., W., F., at 8. Sec. II, M., Th., F., at 10.* Professor BLEILE.

2. GENERAL PHYSIOLOGY. Three credit hours. First term. Short course in Agriculture. Lectures, recitations, and demonstrations. *M., W., F., at 9.* Professor BLEILE.

3. CHEMICAL PHYSIOLOGY. Three credit hours. Course in Domestic Science, third term. *Th., F., 1 to 4.* Professor BLEILE.

ANIMAL HUSBANDRY

(Townshend Hall.)

PROFESSOR PLUMB, ASSOCIATE PROFESSOR GAY, MR. PALMER.

Various methods are made use of in educational work in Animal Husbandry. The University herd contains a large number of very high class, valuable animals. These include excellent specimens for class room work of pure bred Short-

horn, Aberdeen Angus, Galloway, Jersey, Holstein-Friesian, and Red Polled cattle, and a variety of grade and pure bred beef steers. Good specimens of Merino, Southdown, Shropshire and Cotswold sheep and Berkshire, Poland China and Large Yorkshire swine are also kept. The University owns some choice pure bred Percheron, Clydesdale, and Hackney mares, as well as several excellent grade French Coach horses. In addition to this, at convenient distances are famous studs of imported Percheron, French Coach, German Coach and Belgian horses. Students are conducted to stock farms about Columbus and in neighboring counties, where methods of feeding and handling may be studied and animals inspected. Each year a class of twenty-five or more attends the International Live Stock Exposition at Chicago in charge of instructors, spending a few days among the stock exhibits, the Union stock yards, and packing houses. Classroom facilities in animal husbandry include a very extensive collection of herd, flock, and stud books of the various American and European breeding associations, these being used in laboratory work in the Principles of Breeding. There is also a large collection of lantern slides of breeds and types of animals, various instruments for measuring and studying stock, specimens of feeding stuffs, wools, and other animal products.

FOUR-YEAR COURSE

2. TYPES AND BREEDS OF LIVE STOCK. Four credit hours. First term. *M., W., F., at 11; W., 1 to 4.* Professor PLUMB, Associate Professor GAY.

Lectures, text-book, and recitations, upon the history, development, characteristics, and adaptations of types and breeds of horses and sheep. Laboratory work includes judging types and breeds of horses and sheep one afternoon a week and occasional inspection trips to herds in the state.

4. TYPES AND BREEDS OF LIVE STOCK. Four credit hours. Third term. *M., W., F., at 11; W., 1 to 4.* Professor PLUMB, Associate Professor GAY.

Covers the subjects of Cattle and Swine on the same basis as Animal Husbandry 2. (See p. 44.)

6. PRINCIPLES OF BREEDING. Four credit hours. Second term. *M., W., F., at 11; W., 1 to 4.* Associate Professor GAY.

Lectures, text-book, and recitations upon the subjects of heredity from various points of view in its application to breeding farm animals. Library research is required, and for laboratory work one afternoon a week is devoted to studying pedigree construction, and working out problems in heredity from the herd books.

8. FEEDING ANIMALS. Four credit hours. Second term. *M., Tu., Th., F., at 11.* Professor PLUMB.

A consideration of the laws of nutrition, the character and composition of feed stuffs and methods of feeding different kinds of farm animals under varying conditions. Work to a reasonable extent is required of students in calculating rations and in studying rations in practical use in the community and suggesting improvements if desirable. The economy of the subject is carefully considered.

10. HYGIENE AND MANAGEMENT. Four credit hours. Second term. *M., Tu., 1 h., F., at 10.* Associate Professor GAY.

A series of lectures on the sanitation of the stable, on conditions of health surrounding stock in general, and a discussion of the approved methods to be used in managing and caring for horses, cattle, sheep, and swine.

12. ANIMAL CONFORMATION AND STOCK JUDGING. Four credit hours. First term. *F., at 8; Th., F., 1 to 4.* Professor PLUMB, Associate Professor GAY.

This is an advanced class for students who have already had the work of the sophomore year in Courses 2 and 4. The purpose is to give a more detailed consideration to type and breed conformation, with an emphasis on practise in judging groups and classes and rendering required reasons therefor.

14. LIVE STOCK MARKETING AND COMMERCE. Four credit hours. Third term. *M., W., F., at 8; F., 1 to 4.* Professor PLUMB.

A discussion of the purposes and work of live stock markets, methods of sale and shipment, the practises of the live stock markets and yards, the market classifications and grading, the export and import trade, etc. Considerable library work is required in this subject, studying comparative market reports and market development. Visits are also made to stock yards, transportation agencies, packing houses, etc.

16. WOOLS AND OTHER ANIMAL FIBERS. Four credit hours. Second term. *M., W., F., at 8; Th., 1 to 4.* Professor PLUMB.

Lectures and recitations upon the sources of wool supply and other animal fibers, character, composition and classification of wools and fibers, preparation, shipping, methods of shearing, uses of wools, etc. Laboratory work includes instruction in shearing, classifying wools, studying fibers, etc.

19. HIPPOLOGY. Two credit hours. First term. *Tu., Th., at 11.* Associate Professor GAY.

A study of equine intelligence and the training and development of the horse to the purposes of man. This also includes the study of methods of riding and driving, etc.

20. MEATS AND MEAT PRODUCTS. Two credit hours. Second term. *Tu., Th., at 10.* Professor PLUMB.

Methods of slaughter of farm animals, the preparation of the carcass and the various products derived therefrom.

21. THE HARNESS AND VEHICLE. Two credit hours. Third term. *Tu., Th., at 11.* Associate Professor GAY.

A study of the harness and vehicle, their history and development, construction, and adaptability to various uses in connection with the horse.

22. BIOGRAPHICAL STUDIES OF MASTER BREEDERS. One credit hour. Third term. Time to be arranged. Professor PLUMB.

A series of lectures discussing the lives and methods of famous master breeders of live stock.

23. MARKET CLASSES OF CATTLE AND SHEEP. Four credit hours. First term. One lecture hour and two afternoon laboratory periods. Professor PLUMB, Associate Professor GAY.

24. MARKET CLASSES OF HORSES AND SWINE. Four credit hours. Third term. One lecture hour and two afternoon laboratory periods. Professor PLUMB, Associate Professor GAY.

TWO-YEAR COURSE

1. TYPES AND BREEDS OF LIVE STOCK. Four credit hours. First term. *M., W., F., at 9; Tu., 1 to 4.* Associate Professor GAY.

Lectures, text-book, and recitations on the history, characteristics, and adaptations of horses, cattle, sheep, and swine. Laboratory work one afternoon a week in judging types and breeds, and making occasional inspection trips to herds in the State.

3. FEEDING ANIMALS. Three credit hours. Second term. *M., W., F., at 9.*

A study of the principles of nutrition, character, and compo-

sition of feed stuffs and methods of feeding different kinds of farm animals under various conditions.

5. PRINCIPLES OF BREEDING. Four credit hours. Third term. *M., W., F., at 9; Tu., 1 to 4.* Associate Professor GAY.

Text-book, lectures, and recitations upon the subject of heredity in its applications to the breeding of farm animals. Library research is required and for laboratory work a study of pedigrees, problems in heredity, etc., as worked out from the herd books.

SPECIAL DAIRY COURSE

13. DAIRY CATTLE FEEDING. Three credit hours. Second term.

A study of animal nutrition, the composition and character of feeding stuffs, the making up of rations, suiting the varying needs of dairy cattle.

15. DAIRY BREEDS AND BREEDING. Four credit hours. Second term.

Lectures and recitations on the dairy and general purpose of breeds of cattle and the important principles involved in breeding them. The characteristics and values of the dairy animals are considered and laboratory work is given in judging dairy cattle.

ARCHITECTURE

(Brown Hall.)

PROFESSOR BRADFORD

9. HISTORY OF ARCHITECTURE. Three credit hours. First term. Lectures illustrated by lantern slides. *M., W., F., at 11.* Professor BRADFORD.

10. Continuation of 9. Three credit hours. Second term. *M., W., F., at 11.* Professor BRADFORD.

11. Continuation of 10. Three credit hours. Third term. *M., W., F., at 11.* Professor BRADFORD.

ART

PROFESSOR BRACKEN

10. DESIGN AND COMPOSITION. Two credit hours. First term. *Th., or F., 1 to 4.* Professor BRACKEN.

A course designed to develop appreciation of harmony of line, space and color. Brings into play the creative imagination and establishes a basis for critical judgment along all art lines. Representative study of flowers, grasses, foliage, trees, and landscape for

lines of growth and color. Space relation, original designs with straight and curved lines. Nature motives used in design and composition. Study of color theory and harmony. Design for book covers, posters, etc. Charcoal, pencil, ink, and water color are mediums used.

11. Continuation of 10. Two credit hours. Second term. *Th.*, or *F.*, 1 to 4. Professor BRACKEN.

Study of form in common and beautiful objects. Relation of design to construction and use of object and adaptation of suitable ornament. Composition with still life forms. Study of action and proportion as found in the human figure and other animals. Application of same to design. Study of historic ornament. Designs for textiles and rugs. Study of dark and light in design. Application of color schemes.

12. Continuation of 11. Two credit hours. Third term. *Th.*, or *F.*, 1 to 4. Professor BRACKEN.

Landscape. Spring flowers and foliage. Conventionalization of nature forms for use in design. Landscape composition. Designs for interiors.

ASTRONOMY

(Townshend Hall.)

MR. J. WARREN SMITH

3. METEOROLOGY. Two credit hours. Second term. Text-book, Waldo. *Tu.*, *Th.*, at 4. MR. SMITH.

Lectures on practical meteorology and climatology, supplemented by laboratory work in map making. The daily weather maps are discussed and used as a basis for the practical side of the work. Instruction is given in handling the principal meteorological instruments.

BACTERIOLOGY

(Veterinary Laboratory, Rooms 1c and 2c.)

PROFESSOR MORREY, MR. MCCAMPBELL

Bacteria are first studied in a general way and in their relationship to man and his surroundings. Then is taken up a more specific study of their influence and work in soils, in higher plant growth, and in animal life, together with their important and manifold performances in milk, butter, and cheese. In the laboratory is taught the preparation of cul-

ture media, the methods of study for bacteria, the isolation of pure cultures, and the numerical examination of water, milk, and air. The department of bacteriology has in the new Veterinary building a large laboratory room, a private laboratory, two incubator rooms, a room for healthy and one for inoculated animals, incubators, sterilizers, microscopes, and necessary apparatus for about thirty students working at one time.

2. BACTERIOLOGY. Two credit hours. Dairy Course, second term. Time to be arranged.

Lectures and laboratory work on general facts concerning bacteria and their relation to life processes, followed by lectures on their special application to dairy industries.

5. GENERAL. Four credit hours. Three terms. First term. Time to be arranged.

Morphology, preparation of media, culture, and staining methods. second and third terms, special bacteriology along one of the following lines: (a) pathogenic bacteria; (b) agricultural; (c) dairy; (d) sanitary bacteriology and water examination; (e) bacterial chemistry, products of bacterial action, enzymes, ptomaines, toxins, etc.

BOTANY

(Botanical Hall.)

PROFESSOR KELLERMAN, ASSOCIATE PROFESSOR SCHAFFNER. ASSISTANT
PROFESSOR GRIGGS

The department offers good facilities for instruction and investigation. A large number of charts, many of them lithographs, photographs, and mounted illustrative specimens, are among the appliances for daily class work. The museum contains a large amount of illustrative material; the native medicinal plants and the collection of Ohio woods being very complete. The State herbarium consists of between fifteen and twenty thousand sheets of Ohio plants. The large laboratory is well equipped with dissecting and compound microscopes, also the usual appliances for doing both elementary and advanced histological work. The green house attached to the Botanical building is an important adjunct to the department, furnishing much fresh

material for laboratory use. It is also used as a laboratory to carry on special work when growing plants are used.

1. ELEMENTARY BOTANY. Five credit hours. Third term. Text-books, Coulter's Botany and Kellerman's Spring Flora (New edition). *M., Tu., W., F., at 8.* Professor KELLERMAN, Miss DETMERS.

This is a general course introductory to those that follow. It comprises mostly Organography and Vegetable Physiology and a study of the native flora, but some instruction is also given in Ecology and Classification. For the practical or laboratory work, Kellerman's Practical Exercises is used as a guide. The students are required to do some work in the field in both observation and collecting.

6. PHYSIOLOGICAL BOTANY. Four credit hours. First term. Text-book, Barnes' Plant Life. *Tu., Th., at 11; M., Th., or Tu., F., 1 to 3.* Professor KELLERMAN, Assistant Professor GRIGGS.

This is intended to be a complete course showing the evolution of plants from the lowest to the highest. Ecology and Physiology are the more prominent subjects, but some instruction is given in Morphology and Classification. The laboratory work includes a general course in Histology with practise in Experimental Physiology. The student receives instruction and practise in handling the microscope, and has the opportunity of learning much of the important modern methods in technique.

7. ECONOMIC BOTANY. Four credit hours. Second term. *Tu., Th., at 11; M., Th., or Tu., F., 1 to 3.* Professor KELLERMAN, Assistant Professor GRIGGS.

This course is, in part, a continuation of Course 6, and the same text-book is used, but the major part of the term is devoted to a botanical study of economic plants and the vegetable products of commerce. The laboratory work includes the microscopic study of fibers, starches, resins, gums, and many other important vegetable products.

8. VEGETABLE PATHOLOGY. Four credit hours. Third term. *Tu., Th., at 11; M., Th., or Tu., F., 1 to 3.* Professor KELLERMAN, Assistant Professor GRIGGS.

The diseases of plants due to inorganic causes are briefly studied, but the main part of the course is devoted to a study of the parasitic fungi most destructive to cultivated plants. The means of their prevention forms the last part of the course. The laboratory and field work deals mainly with the commonest and most injurious parasitic fungi. Each student takes some economic subject or

group of parasites for special study during the latter part of the term; he is also required to devote two hours each week to the execution of an experiment in plant pathology.

13. HOUSEHOLD BOTANY. Four credit hours. Third term. *M., W., at 9; Tu., 10 to 12; M., 1 to 3.* Professor KELLERMAN, Assistant Professor GRIGGS, Miss DETMERS.

This course is planned exclusively for students in Domestic Science, and is devoted to those phases which directly concern household work and home life. It includes a study of such economic species as culinary, medicinal, starch, oil, and fiber-producing plants. Special attention is given to yeast, fermentations, enzymes, bacteria, antiseptics, fungicides, food-destroying fungi, and edible and poisonous mushrooms.

17. FOREST BOTANY. Four credit hours. First term. Prerequisite, Botany 6, 7, and 8, or 21, 22, and 23. *Tu., Th., at 3; laboratory and field work, Tu., Th., 1 to 3.* Associate Professor SCHAFFNER.

It includes a study of native and introduced trees and the preparation of a dendrological herbarium; attention is given to the determination of trees by means of leaf and twig characters. Lectures and seminars.

18. NORMAL AND PATHOLOGICAL HISTOLOGY OF WOOD. Four credit hours. Second term. *Tu., Th., at 3; laboratory, Tu., Th., 1 to 3.* Associate Professor SCHAFFNER.

This is a continuation of Course 17, and includes a study of the development of woods, characters of coniferous, hard, and soft woods and changes due to attacks of fungi. The students are required to prepare a series of gross and microscopic sections. Seminars.

19. FOREST ECOLOGY AND PATHOLOGY. Four credit hours. Third term. *Tu., Th., at 3; laboratory, Tu., Th., 1 to 3.* Associate Professor SCHAFFNER.

This is a continuation of Course 18, and includes a study of the genetic development of local forests, as well as other ecologic conditions, and a general consideration of fungi injurious to trees and wood. Students are required to prepare a pathological herbarium. Lectures and seminars.

9. DENDROLOGY. Two credit hours. First term. *M., W., 10 to 12.* Professor KELLERMAN, Miss DETMERS.

Lectures and field work. Kellerman's Forest Trees of Ohio and various reference books are used. The native trees are studied and illustrative collections made.

10. DENDROLOGY. Two credit hours. Second term. Laboratory open daily, 8 to 12. Professor KELLERMAN.

Laboratory work and special investigations on the structure and diseases of timber.

11. LABORATORY WORK. Two to five credit hours. Three terms. Laboratory open daily, 8 to 12. Professor KELLERMAN, Associate Professor SCHAFFNER.

Special investigations in Economic Botany and Vegetable Pathology.

CHEMISTRY

(Chemical Hall.)

PROFESSOR MCPHERSON, ASSISTANT PROFESSOR EVANS, MR. VOGT, MR. MORRIS AND DEPARTMENT FELLOWS.

The laboratories of the department accommodate over one thousand students. Each laboratory is equipped with all the necessary conveniences—water, gas, electric lights, distilled water piped from a large still in the attic, steam ovens, automatic air blasts, suction pumps, etc. The department is liberally supplied with the best apparatus and materials for both lecture room and laboratory work. Each student has his own desk, with drawers and locker. All supplies are procured from the chemical store room, which has always on hand a complete stock of all necessary materials.

7. ELEMENTARY CHEMISTRY. Four credit hours. First and second terms. Lecture, *M.*, at 8; quiz, *F.*, at 8; laboratory, *M.*, *Tu.*, 1 to 4, or *Th.*, *F.*, 1 to 4, or *W.*, 8 to 10; *S.*, 8 to 12. Assistant Professor EVANS, Mr. VOGT, Mr. MORRIS, and department fellows.

During the first term, the work is confined to a study of the non-metals and the general laws of chemistry. The metals are studied during the second term. The laboratory work bears directly on the subject under discussion in the class room.

44. GENERAL CHEMISTRY. Four credit hours. First and second terms. First term, lecture, *M.*, *W.*, at 3; quiz, *F.*, at 8; laboratory, *F.*, 1 to 4, or *S.*, 8 to 11. Second term, lecture, *M.*, at 3; quiz, *F.*, at 8; laboratory, *Th.*, *F.*, 1 to 4, or *W.*, 8 to 10; *S.*, 8 to 12. Professor MCPHERSON, Assistant Professor EVANS, Mr. VOGT, Mr. MORRIS, and department fellows.

Lecture, quiz and laboratory work. This course is arranged for

students who present chemistry as an entrance requirement.

3. **ELEMENTARY CHEMISTRY.** Four credit hours. Short courses. First and second terms. Lecture, *M.*, at 10; quiz, *Th.*, at 8 or 11; laboratory, *M., Tu.*, 1 to 4, or *Th., F.*, 1 to 4. Assistant Professors EVANS, WITHROW, MR. VOGT, MR. MORRIS, and department fellows.

12. **QUALITATIVE ANALYSIS.** Four credit hours. Third term. One lecture, one quiz and six hours' laboratory work. For time, see 7 or 44. Assistant Professors EVANS, WITHROW, MR. VOGT, MR. MORRIS, and department fellows.

After working through the preliminary tests for the acids and metals, each student is required to work out a number of unknown substances.

45. **QUALITATIVE ANALYSIS.** Four credit hours. One lecture, one quiz and six hours' laboratory work. Short courses, third term. For time, see 3. Assistant Professors EVANS, WITHROW, MR. VOGT, MR. MORRIS, and department fellows.

42. **ELEMENTARY ORGANIC CHEMISTRY.** Two credit hours. Third term. *Tu., Th.*, at 10. Assistant Professor EVANS.

This course consists in a study of a few of the more important classes of organic compounds, preparatory to the work in Agricultural Chemistry.

43. **ELEMENTARY ORGANIC CHEMISTRY.** One credit hour. Second term. Short courses. *Th.*, at 10. MR. BROOKS.

DAIRYING

(Townshend Hall.)

PROFESSOR DECKER, MR. GUTHRIE, MR. MANGOLD

The dairy laboratories permit of work along the following lines: Milk Testing, Buttermaking, Cheesemaking, Bottling of Sanitary Milk, and Dairy Mechanics.

Individual milk testing apparatus is furnished, and in the laboratory are found the necessary Babcock testers, balances, etc. The creamery laboratory is equipped with various styles of cream separators, cream ripeners, starters, cans, and churns. The cheese laboratory is well equipped and has a cold curing room and a cellar for curing brick and Swiss cheese. Butter is made throughout the year on a creamery basis from the milk and cream from a number of

dairies aggregating over one hundred cows. The sanitary milk room is a model, containing a complete "Star" outfit, which includes a steam pressure sterilizing chest. A fine refrigerator is provided for the bottled milk, and the whole is placed on a practical basis of operation, the milk from the University herd being standardized on a fat basis, bottled, and sold, students doing the work.

The dairy mechanics work is provided for in a powerhouse with equipment of boiler, engine, mechanical refrigerating plant, pump and pipe fitting apparatus.

It is intended that the laboratory work shall be of the most practical kind and is supplemented by lectures, recitations, and quizzes in the class room.

The work of the department is designed for two classes of students, namely, the regular students in the two and four-year courses, and a special winter class of dairymen, who come for the special dairy course designed to train dairymen who cannot devote a longer time to scientific dairy methods.

1. BUTTERMILKING AND CHEESEMAKING. Six half-days. *M., Tu., W., Th., F., S., 7 to 12.*

The work of this course consists of laboratory practise in bottling milk, testing milk, operating cream separators and pasteurizers, churning and packing butter and making cheese.

2. DAIRY LABORATORY. Six credit hours. Second term.

The special needs of individual students will be recognized. For those who wish further work in buttermaking, a special study of churn gain, starters, etc., will be offered. Practise will be given in the manufacture of fancy products, such as cottage, Neufchatel, and cream cheese, junkets, ice cream. Students will also be assigned to the engine room for mechanical work.

3. DAIRY LECTURES. Five credit hours. Professor DECKER.

The elements of Dairying, covering the composition, secretion, and contamination of milk, will be thoroughly discussed, also the fundamentals of butter and cheesemaking, and the testing of milk and its products.

4. CREAMERY LECTURES. Three credit hours. MR. GUTHRIE.

The principles of buttermaking, including use of starters, cream ripeners, printers, etc., and creamery management will be considered.

21. DAIRY MECHANICS. Three credit hours. Three lectures per week. MR. MANGOLD.

The construction and management of the steam boilers and engine pumps, refrigerating machines, etc., and in pipe fitting, hanging of shafting, etc.

TWO AND FOUR-YEAR COURSES

12. ELEMENTS OF DAIRYING. Five credit hours. First term. *Tu., Th., at 8; M., Tu., 1 to 4, or F., 1 to 4; S., 8 to 11.* Professor DECKER.

In the lecture room, the composition, secretion, contamination, and production of sanitary milk will receive attention. In the laboratory, the work will consist of testing milk and its products for purity, testing the dairy herd for butter fat production, bottling sanitary milk, operating the boiler and engine, and pipe fitting, with a view to laying a broad foundation for further dairy work.

14. BUTTERMILKING. Five credit hours. Third term. Prerequisite, Dairying 12. *Tu., Th., at 8; M., Tu., 1 to 4, or W., Th., 1 to 4, or F., 1 to 4; S., 8 to 12.* MR. GUTHRIE.

In the lecture room, the principles of making butter, including cream separation, pure cultures, churning, packing and marketing butter, will be thoroughly discussed. In the laboratory, the work discussed in the lecture room will be put into practise.

16. CHEESE AND FANCY DAIRY PRODUCTS. Five credit hours. Second term. *Tu., Th., at 8; M., Tu., 1 to 4, or W., Th., 1 to 4, or F., 1 to 4; S., 8 to 12.* Professor DECKER.

While cheesemaking is the basis of this course, and demonstrations will be given in the manufacture of Cheddar, Swiss, and brick cheese, the subject will be treated from the standpoint of the farmer who sells his milk to the factory rather than that of the cheesemaker. Fancy products, such as cottage, Neufchatel, and soft cream cheese, junkets, ice cream, etc., will be considered.

22. DAIRY MECHANICS. Three credit hours. First term. MR. MANGOLD.

This work will consist of one lecture and two three-hour laboratory periods. It will treat of the construction and operation of the steam boiler and engine, steam pumps, belting, hanging of shafting and pulleys, pipe fitting and soldering. It is intended to train the students to do the mechanical work in a farm dairy, cheese factory, and creamery.

23. ADVANCED DAIRYING. Three credit hours. Second and third terms. Professor DECKER.

Work in dairy mechanics or buttermaking may be continued—or a seminar on assigned readings in experiment station and other dairy literature will be arranged, and laboratory work suggested by the line of reading may be pursued. The purpose of the course is to enable the student, who wishes to specialize in dairying, to follow with wide latitude the various lines of dairy work.

COURSE FOR DOMESTIC SCIENCE STUDENTS

20. HOUSEHOLD DAIRYING. Two credit hours. Third term. Time to be arranged. Professor DECKER.

The composition of milk and its products, and the production of sanitary and modified milk will be considered. In the laboratory, demonstrations in testing milk and butter for purity, making of butter, cheese, junkets, and ice cream will be given.

DOMESTIC SCIENCE

(Hayes Hall.)

PROFESSOR STONER, ASSOCIATE PROFESSOR BABE

DOMESTIC SCIENCE

The work consists of lectures, recitations, laboratory investigations, and experiments, with collateral readings. The equipment of the department has been carefully selected and is adequate for thorough, systematic, and conscientious work. Every effort is made to develop the course along broad and safe lines and to keep in touch with the best methods in progressive educational work.

1. FOOD ECONOMICS. Five credit hours. First term. *Tu., Th., at 9; Tu., W., 1 to 4.* Professor STONER.

(a) Lectures, etc. A study of the evolution of society as effected by food conditions; a study of the food principles and their functions; the history, manufacture and use of food materials; the caloric value, the relative nutritive and money value of typical foods of certain classes; Chemistry as applied in the study of the science of nutrition and general Dietetics, Dietary studies, etc. Collateral readings are required. (b) Laboratory instruction includes experimental and research work with typical foods of certain classes, and the scientific and practical application of certain principles in food investigation, demonstration, etc.

2. FOOD ECONOMICS. Five credit hours. Second term. *Tu., Th., at 9; Tu., W., 1 to 4.* Professor STONER.

(a) Lectures, etc. This includes a continuation of the subject

outlined in Course 1, and marketing, etc., calculations in Dietary work, considering varying conditions of life. Collateral readings are required. (b) Laboratory work is a continuation of Course 1.

3. ADVANCED FOOD ECONOMICS. Five credit hours. Third term. *Tu., Th., at 9; Tu., W., 1 to 4.* Professor STONER.

(a) Lectures, etc. This subject includes advanced research in Food Economics and Dietetics as outlined in Course 2, and a brief study of the preservation of foods, etc. Collateral readings are required. (b) Laboratory work is a continuation of the advanced work as outlined in Course 2.

4. PRESERVATION OF FOODS AND HYGIENE OF CLOTHING. First term. Five credit hours. *Tu., Th., at 11; Th., F., 1 to 4.* Professor STONER.

(a) Continuation of Course 3. Includes a brief study of the causes of decomposition; a history of the methods employed in the preservation of foods; the economic value of canned foods and the principles involved in canning, preserving, etc.; a brief study of the sugars and the food value of fruits, etc. (b) Includes a study of the structure of fibers and their proper treatment; the properties and cleansing effects of water and soap; the effect of blueings, etc.; experimental work with chemical re-agents for the treatment of all kinds of stains, etc., and the use of disinfectants and their properties. Lectures on hygiene of clothing and the proper care of all kinds of house linens, etc. Demonstration work in practical laundry methods.

10. HOUSEHOLD ECONOMICS. Two credit hours. Third term. *Tu., Th., at 11.* Professor STONER.

A consideration of the best location for a house; its hygienic and sanitary construction and arrangement. A consideration of water supplies, sanitary drainage, care of plumbing, etc. Discussion of approved methods of the management of lighting, heating, and ventilation systems. A study of the best practical and scientific methods of general household management. Furnishings of the home from the standpoint of utility, sanitation, and economy. A study of household accounts and expenditures, etc. Collateral readings are required.

11. SPECIAL DIETETICS AND EMERGENCY WORK. Three credit hours. Second term. Prerequisite Courses 1, 2, 3, and 4. *Th., at 10; Th., 1 to 4.* Professor STONER.

The lectures, demonstrations, and practical work are designed to set forth the principles of the dietetic treatment of special cases, and to consider such emergency cases as frequently require prompt

treatment in the home, as well as the principles underlying home nursing. Food suitable for special cases is prepared in the laboratory work.

12. THEORY AND PRACTISE OF DOMESTIC SCIENCE. Three credit hours. Third term. *Th.*, at 10; *Th.*, *F.*, 1 to 4. Professor STONER.

This course is designed for young women who desire to take special professional training in Home Economics and who wish to study the educational, economical, scientific, and practical principles involved in the application of those subjects in professional work. A study of courses of work and equipment in various schools, planning and furnishing of class rooms, and laboratories. Lectures, conferences and practical work in teaching, etc.

13. SEMINARY. One credit hour. Three terms. Special investigations in Domestic Science. Open only to fourth year and graduate students. Time to be arranged. Professor STONER.

DOMESTIC ART

The object of this course is to give the student an insight into that cultural development of the race which has been gained through handwork. The work is taken up along advanced educational lines and effort is made continually to correlate the subjects taught in Domestic Art with other University work. The work consists of lectures, recitations, laboratory practise, with collateral readings.

1. HAND CRAFT. Two credit hours. First term. *W.*, at 11; laboratory, *Th.*, 1 to 4, or *F.*, 1 to 4. Associate Professor BABB.

A systematic study of the principles of plain needle work. The application in various articles. A study of race development as shown in hand work and in the evolution of spinning and weaving. Lectures and recitations.

2. TEXTILES. Two credit hours. Second term. *W.*, at 11; laboratory work, *Th.*, 1 to 4, or *F.*, 1 to 4. Associate Professor BABB.

This course covers a study of fabrics, history, processes of manufacture and the development of these processes, economic values and their effect on social conditions. Also garment making; the taking of accurate measurements, drafting by simple measurements; the choice and economical cutting of materials, and the making of garments. Lectures, discussions, and essays.

3. A continuation of Course 2. Two credit hours. Third term. *W.*, at 11; laboratory, *Th.*, 1 to 4, or *F.*, 1 to 4. Associate Professor BABB.

4. HISTORY OF COSTUME. DESIGN AND DRESSMAKING. Four credit hours. Second term. Prerequisite, Courses 1, 2, and 3. *Tu., Th., at 9*; laboratory work, *Tu., W., 1 to 4*. Associate Professor BABB.

Costume designing; making of patterns from systems of dress-making; making waists and skirts, and tailor pressing and construction. Fall Millinery.

5. HOUSEHOLD ART AND DECORATION. A continuation of Course 4. Five credit hours. Third term. Prerequisite, Courses 1, 2, and 3. *Tu., Th., at 9*; laboratory work, *Tu., W., 1 to 4*. Associate Professor BABB.

Art in every day life; effect of color in the home; healthful and beautiful clothing and furniture. Spring Millinery, practical construction and artistic trimming of hats.

6. THEORY AND PRACTISE OF TEACHING DOMESTIC ART, AND ADVANCED NEEDLE WORK. Three credit hours. First term. *Th., at 9*; laboratory, *W., 1 to 4*. Associate Professor BABB.

This Course deals with the place of Domestic Art in modern education. A study of courses of work and equipment in various schools, the organization and management of departments, the planning and furnishing of class rooms and laboratories.

7. EMBROIDERY. One credit hour. Three terms. Prerequisite Domestic Art 1, 2, and 3. Time to be arranged. Associate Professor BABB.

This Course aims to give the student a knowledge of stitchery used in decorative art, and also the applications of these principles in the completed article. It considers the question of art in applied design, and connects its work directly with Domestic Art 4 and 5, and Drawing 29, or Art 10, 11, and 12. The decoration of undergarments and fancy dress waists, of household articles, of collars, and cuffs, and the like, receive attention.

NOTE.—*In all courses except Course 1 students provide their own material.*

DRAWING

(See Engineering Drawing.)

ECONOMICS AND SOCIOLOGY

(University Hall. Office, Room 211.)

PROFESSOR HAGERTY, ASSOCIATE PROFESSOR HAMMOND AND MR. GEPHART.

33. ELEMENTS OF POLITICAL ECONOMY. Three credit hours. Three terms. *M., W., F., at 9*. MR. GEPHART.

A careful study of the laws of production, exchange, distribution, and consumption of wealth; combined with an analysis of the industrial actions of men as regards land, labor, capital, money, credit, rent, interest, wages, etc. Text-book, lectures and individual investigations.

42. PUBLIC FINANCE AND TAXATION. Two credit hours. First and second terms. Text-book, Adams' Finance. *Tu., Th., 2.* Prerequisite, 33. Associate Professor HAMMOND.

This Course aims to make the student acquainted with the theory of public revenue and expenditure, and with the leading systems of financial administration throughout the world.

43. FINANCIAL HISTORY OF THE U. S. Third term. Two credit hours. *Tu., Th., at 2.* Prerequisite, Course 42. Associate Professor HAMMOND.

44. TRANSPORTATION. Two credit hours. Three terms. Prerequisite, 33. Associate Professor HAMMOND.

The public character of the transportation industry. The history of transportation. Growth of the railway system and the principal lines of communication. The relation of the railroad to other means of transportation. The organizations and management of railroads. Railway capitalization. Railway rates, pools, mergers, and consolidations. Railway commissions and public control. Government ownership of railroads. Especial attention is given to the railway problem in the United States.

EDUCATION

(University Hall, Room 407.)

PROFESSOR MAJOR.

1. EDUCATIONAL PSYCHOLOGY. Three credit hours. Three terms. Open to second-year students. *M., W., F., at 11.* Professor MAJOR.

The work will be based on James' Talks on Psychology and Horne's Psychological Principles of Education, supplemented by references to standard psychological and educational literature. Emphasis is laid upon the function of psychology in determining the selection and arrangement of school studies as well as upon its bearing on class-room procedure.

ENGINEERING DRAWING

(Brown Hall, Rooms 42, 46.)

PROFESSOR FRENCH, ASSISTANT PROFESSOR MAJOR, MR. TIDBALL, MR. MEIKLEJOHN, MR. ROGERS, MR. NORRIS.

10. MECHANICAL DRAWING. Three credit hours. First term. *M., Tu., 1 to 4; Th., F., 1 to 4.* Professor FRENCH, MR. MEIKLEJOHN.

Lectures and practise. Elementary mechanical drawing, lettering and working drawings.

20. MECHANICAL DRAWING. One credit hour. First term. *M., 1 to 4.* Professor FRENCH.

Lectures and practise. Elementary mechanical drawing and lettering.

29. FREEHAND DRAWING. One credit hour. Three terms. Practise and occasional lectures. *Th., or F., 1 to 4.*

14. PEN DRAWING. Two credit hours. First term. Prerequisite, Course 28. *M., Tu., 2 to 4.* MR. NORRIS.

15. TECHNICAL DRAWING. One and one-half credit hours. Second and third terms. House planning. Prerequisite Course 20. Professor FRENCH.

40. CLAY MODELING. Two credit hours. Second term. Prerequisite, Drawing 27. *M., Tu., 1 to 3, or Tu., 1 to 5.*

Modeling in clay, ornamental forms from plaster casts, photographs, and nature.

41. CLAY MODELING. Two credit hours. Third term. Prerequisite, Drawing 40. *M., Tu., 1 to 3, or Tu., 1 to 5.*

Modeling in clay and wax from photographs, nature, and original designs. Casts made in plaster and gelatine moulds.

ENGLISH

(University Hall, Rooms 117 to 120.)

PROFESSORS DENNEY, BARROWS, ASSOCIATE PROFESSOR TAYLOR, ASSISTANT PROFESSORS GRAVES, MCKNIGHT, DUNCAN, MR. MCKINNEY, MR. PARKER, MISS RICHARDSON.

1. PARAGRAPH WRITING AND ANALYSIS OF PROSE. Two credit hours. Three terms. Text-book, Scott and Denney's Paragraph Writing. *Tu., Th., or W., F., at 8; Tu., Th., at 9, 10, or 11.* Professor DENNEY, Associate Professor TAYLOR, Assistant Professors

GRAVES, McKNIHGT, DUNCAN, Mr. McKINNEY, Miss RICHARDSON.

The course includes two exercises weekly, in the writing of short themes, the outlining and composition of essays and speeches, and the study of illustrative texts for structure and form.

3. BRIEF MAKING AND WRITTEN ARGUMENTATION. Two credit hours. First, second, and third terms. Prerequisite, Course 1. *M., F., at 10; Tu., Th., 9, 10, or 11.* Professor DENNEY, Assistant Professor DUNCAN, Mr. McKINNEY, Mr. BLANCHARD.

The course includes a study of the principles of logical analysis, evidence and argumentation; practise in writing briefs of noted speeches (Baker's Specimens); and in preparing original briefs with written arguments.

5. ADVANCED COMPOSITION. Two credit hours. First, second, and third terms. Prerequisite, Courses 1 and 2. *Tu., Th., at 11.* Assistant Professor GRAVES.

This Course affords practise in one or more of the forms of composition studied in Courses 1 and 2 (exclusive of argumentation).

7. INTRODUCTION TO ENGLISH LITERATURE. Three credit hours. Three terms. No prerequisite course. *M., W., F., 8 to 9.* Professor BARROWS.

Moody and Lovett's English Literature; literary analysis and interpretation; critical study of selections beginning with those in Palgrave's Golden Treasury.

8. GENERAL SURVEY OF ENGLISH LITERATURE. Three credit hours. Three terms. No prerequisite course. *M., W., F., at 11 or 3.* Associate Professor TAYLOR, Assistant Professor GRAVES.

An extensive reading course intended especially for those whose scheme of work permits no further courses in English.

FRENCH

(See Romance Languages.)

GEOLOGY

(Orton Hall.)

PROFESSOR PROSSER, PROFESSOR BOWNOCKER, ASSISTANT
PROFESSOR HUBBARD.

The University is able to present unusual advantages for the study of Geology. By an act of the Legislature it

has been put in possession of all the collections made by the State Geological Survey, and these collections have been supplemented by valuable additions of fossils and minerals from various sources. This collection embraces a very complete representation of every geological formation shown in Ohio. Orton Hall, completed at a cost of more than \$100,000, is designed for the permanent accommodation of the large geological collection of the University and for the work and instruction in the department of Geology. A portion of it, at present, is occupied by the library and reading room. The building is two stories in height, with a high basement; is built of brick and faced with sandstone, and is fireproof throughout. Some of the material was contributed by various quarries of the State of Ohio, and almost all of the finer varieties of Ohio building stone are represented in the columns, walls, and ceiling panels of the vestibule. At the right of the main entrance is the geological lecture room; at the left is the University library and reading room. The central and rear portion is occupied by the geological and paleontological museums. In the basement the economic museum is located. On the second floor are located the stratigraphical and petrographical laboratories.

1. ELEMENTARY PHYSIOGRAPHY. Five credit hours. Third term. *M., Tu., W., Th., F., at 11.* Assistant Professor HUBBARD.

The physiographic features of the earth's surface and the agencies producing them; the atmosphere, and the ocean. Recitations, lectures and map work. One period per week will be devoted to laboratory work.

2. GENERAL GEOLOGY. Five credit hours. First term. Lectures and recitations, *M., Tu., W., F., at 11*; laboratory, *Th.*, 8 or 9; field work, first half of term, *F.* afternoon or *S.* forenoon, when the *F.* lecture will be omitted. Professor PROSSER, Assistant Professor HUBBARD.

Structural, dynamical, and historical geology. The lectures are illustrated by maps, specimens, and lantern views. The common rock-forming minerals and rocks are studied in the laboratory; while in the field specimens are collected, sections measured, formations identified, and the student given an idea of the method of work pursued by a field geologist.

5. APPLIED GEOLOGY. Four credit hours. Second term. Lec-

tures, *M.*, *Tu.*, *W.*, *Th.*, at 8; laboratory, *F.*, at 8. Professor BOW-
NCKER.

The common minerals and rocks composing the earth's crust, their disintegration and decomposition. Soils, their origin and classification; the soils of the United States, and especially those of Ohio. Fuels, coal, oil, and gas. Building stones, limes, and cements.

GERMANIC LANGUAGES AND LITERATURES

(University Hall, Rooms 30 and 32.)

PROFESSOR RHOADES, ASSOCIATE PROFESSOR VILES, ASSISTANT PROFESSOR
EISENLOHR, DR. MAY THOMAS, DR. A. BUSSE.

1. ELEMENTARY. Four credit hours. Three terms. *M.*, *Tu.*, *Th.*, *F.*, 10 or 11; *Tu.*, *W.*, *Th.*, 2 or 3. Associate Professor VILES, Assistant Professor EISENLOHR.

Elements of inflection and syntax, translation of easy prose, prose composition and practise in reproduction of texts read.

2. SCIENCE READING. Four credit hours. Third term. Prerequisite, first and second terms of Course 4. *Tu.*, *W.*, *Th.*, *F.*, 8 or 9. Assistant Professor EISENLOHR.

4. INTERMEDIATE GERMAN. Four credit hours. Three terms. Prerequisite, Course 1, or two years High School work. *M.*, *Tu.*, *Th.*, *F.*, 10 or 11. Professor RHOADES, Associate Professor VILES, Assistant Professor EISENLOHR.

Translation of standard prose, prose composition and grammatical drill. In the third term the class will read one or more of the plays of Schiller.

10. MODERN PROSE AND DRAMA. Three credit hours. Three terms. Prerequisite, three terms of Course 4, or four years of High School work. *M.*, *W.*, *F.*, at 3. Dr. THOMAS.

19. RECENT AND CONTEMPORARY WRITERS. Three credit hours. Three terms. *M.*, *W.*, *F.*, at 2. Prerequisite, Course 4, or equivalent. Professor RHOADES.

HISTORY

(See American History and Political Science.)

HORTICULTURE AND FORESTRY

(Horticultural Hall.)

PROFESSOR LAZENBY, ASSISTANT PROFESSOR DAVIS.

This department has about twenty-five acres of land. About one-half of this area has been planted with varieties of cultivated fruits. The remainder is devoted to market gardening. Among the facilities for instruction and illustration that deserve special notice are two vegetable forcing houses, with packing rooms, tool rooms, etc. These houses are attached to Horticultural Hall and are each one hundred and twenty feet long by twenty feet in width. They are heated by hot water. One interesting feature in the management of the forcing houses is the method of watering by sub-irrigation. This method had its origin in these houses, and marks a great step in advance in green-house management. Lettuce, radishes, cucumbers, parsley, cauliflower, onions, rhubarb, asparagus, and other vegetables are grown in the forcing houses during the college year. Among the additional facilities provided are (1) orchards, containing well-selected varieties of apple, pear, plum, cherry, and quince; (2) small fruit plantations, stocked with some of the best varieties of strawberry, raspberry, blackberry, currant, and gooseberry; (3) large vegetable gardens, with pipe-heated hot-beds, cold frames, conveniences for irrigation, experimental plats, etc.; (4) a small nursery and forest tree plantation, with practise rows for budding, grafting, pruning, and training; (5) ornamental grounds and native woodland, containing a large variety of evergreen and deciduous trees and shrubs; (6) a collection of seeds, woods, and other preserved natural specimens; (7) a collection of fruit in jars, also models of apples, etc.; (8) a laboratory well equipped with dry ovens, balances, seed testers, and other appliances for study and research; (9) a collection of horticultural hand tools for budding, grafting, pruning, etc.; (10) a small apiary of a dozen or more colonies of bees.

1. ELEMENTS IN HORTICULTURE. Four credit hours. First term. Lectures and recitations, *M., W., F.*, 9 or 11; laboratory or practicum, *M., or W.*, 1 to 3. Assistant Professor DAVIS.

A study of the principles of plant growth and culture, including tillage, drainage, irrigation, weeds, insects, etc., in their relation to horticultural crops.

2. VEGETABLE FORCING. Four credit hours. Second term. Lectures and recitations, *M., Tu., Th.*, at 8; laboratory or practicum, *W.*, 1 to 3. Assistant Professor DAVIS.

A study of the history and development of different types of plant houses, including methods of heating, ventilating, and general management.

3. PLANT PROPAGATION. Four credit hours. Third term. Lectures and recitations, *M., W., F.*, 9 or 11; laboratory or practicum, *M., or W.*, 1 to 3. Assistant Professor DAVIS.

The theory and practise of multiplying plants by seeds, layers, cuttings, grafts, and divisions; pruning and training; spraying, history of the development and use of insecticides and fungicides, together with a study of different remedies for particular insects and plant diseases.

5. VARIETIES OF CULTIVATED FRUIT. Four credit hours. First term. Lectures and recitations, *M., W., F.*, at 9; laboratory and practicum, *F.*, 1 to 3. Professor LAZENBY.

A study of history, characteristics, adaption and general qualities of orchard and garden fruits, including their commercial and food values. The judging and scoring of apples, pears, peaches, grapes, citrous and nut fruits.

6. PRINCIPLES OF FRUIT CULTURE. Four credit hours. Second term. Lectures and recitations, *M., W., F.*, 9 or 11; laboratory and practicum, *M., or F.*, 1 to 3. Assistant Professor DAVIS.

A study of the location, tillage, and fertilizing of orchards and gardens; the selection of varieties, laying out, planting and general management of fruit plantations, harvesting, marketing and storing fruit.

14. OLERICULTURE. Four credit hours. Third term. Lectures and recitations, *Tu., Th., S.*, at 8; laboratory or practicum, *F.*, 1 to 3. Assistant Professor DAVIS.

Principles of home and truck gardening, including a study of the culture, soil, climate, and market conditions to be considered in relation to the various garden crops.

8. ORNAMENTAL PLANTS. Two credit hours. First term. Time to be arranged. Professor LAZENBY.

A study of the history, classification, general characteristics, propagation, and culture of ornamental plants, together with their uses for home and public grounds.

9. WINDOW GARDENING AND FLORICULTURE. Two credit hours. Second term. *Tu., Th., 8 or 9.* Professor LAZENBY.

Including the general management of house plants, the home conservatory, commercial greenhouse, and the propagation and uses of flowers and plants for decoration.

10. HOME GARDENING. Two credit hours. Third term. *Tu., Th., 8 or 9.* Professor LAZENBY.

The location, planting and management of the kitchen garden, and the laying out and treatment of the ornamental grounds about the home.

15. LANDSCAPE GARDENING. Three credit hours. Third term. *M., W., F., at 8; practicum, F., 1 to 3.* Professor LAZENBY.

A study of the art of producing picture-like or landscape effects; the making of lawns, walks and drives, and the correct planting of trees, shrubs, and flowers for the external adornment of home and public grounds.

11. ELEMENTS OF FORESTRY. Five credit hours. First term. Lectures and recitations, *M., W., F., at 9; laboratory or practicum, Th., 1 to 3.* Professor LAZENBY.

Our native and introduced trees and shrubs treated individually and collectively; their use for timber, fuel, shelter, ornament, etc. Methods of propagation and culture.

12. FOREST TECHNOLOGY AND TIMBER PHYSICS. Five credit hours. Second term. Lectures and recitations, *M., W., F., at 9; laboratory or practicum, Th., 1 to 3.* Professor LAZENBY.

The principles and methods of establishing, improving, and managing woodlands; including the measurements and estimates of standing timber and harvesting of forest products; a study of the more important physical properties of wood.

13. FOREST ECONOMICS. Five credit hours. Third term. Lectures and recitations, *M., W., F., at 9; laboratory or practicum, Th., 1 to 3.* Professor LAZENBY.

The economic features of modern forestry; the influence of forests upon climate, soils, and crop production; forest valuation, protection and administration; forest laws and forest policies; forestry conditions in Ohio and other States.

16. NATURE STUDY. Two credit hours. First term. Lectures, recitations, and practicum, *Th.*, at 11; *M.*, 1 to 3. Assistant Professor DAVIS.

A course intended primarily for those who are or expect to become teachers; treating of the objects and aims of nature study, with lectures on some of the interesting things to be found everywhere about us, indicating how such material can be advantageously used by the teacher in class room work.

17. PLANT VARIATIONS. Two credit hours. Second term. Lectures and recitations, *Tu.*, *Th.*, at 9. Professor LAZENBY.

A course designed for those interested in plant breeding and in the modification and improvement of plants by mutation, crossing, dwarfing, forcing, etc., together with a discussion of the current theories of evolution as applied to the variation and amelioration of plants under cultivation.

18. APICULTURE. Three credit hours. Second term. *Tu.*, *Th.*, at 10; practicum, *Th.*, 1 to 3. Professor LAZENBY.

A course in the theory and practise of bee-keeping. Lectures, recitation, and practise.

INDUSTRIAL ARTS

(Hayes Hall, Rooms 5 and 17.)

PROFESSOR SANBORN, MR. RENCK, MR. CROWE.

The shops occupy the north wing of Hayes Hall and afford excellent facilities for instruction in both the practical details and the underlying principles of carpentry, pattern-making, and forging. The carpenter and pattern shops are equipped with twenty-five benches with complete sets of carpenter tools for each, twenty-four turning lathes with the necessary turning tools, a pony planer, a buzz planer, a circular rip and cross-cut saw, a scroll saw, a band saw, a trimmer, and power grindstone. The forge shop is equipped with twenty stationary forges with anvils and tools for each, a heating forge, a portable hand forge, a foot power hammer, a blacksmith's drill and a punch, shear, and bar cutter.

I. CARPENTRY AND PATTERN MAKING. *M.*, *Tu.*, 1 to 4, or *Th.*, *F.*, 1 to 4, or *W.*, 1 to 4; *S.*, 8 to 11; also *Tu.*, *Th.*, 9 to 12.

Practise in carpentry, wood-turning and pattern making, including sawing, planing, mortising, framing, and other work involving

the use of the ordinary carpenter tools; center and chuck turning, and the making of simple patterns.

2. FORGING. Time, same as Course I.

The use and care of forge, fire, and tools; practise in iron and steel forging, including such operations as cutting, bending, drawing, upsetting, shaping, and welding iron; the making, hardening, and tempering of steel punches, drills, and cold chisels.

MATHEMATICS

(University Hall, Room 314.)

PROFESSOR BOHANNAN, ASSISTANT PROFESSOR PRESTON.

1. ELEMENTARY ALGEBRA. Five credit hours. First term. Venable. *M., Tu., W., Th., F., at 9.* Assistant Professor PRESTON.

3a. PLANE GEOMETRY. Five credit hours. Second term. Venable. *M., Tu., W., Th., F., at 9.* Assistant Professor PRESTON.

MILITARY SCIENCE AND TACTICS

(Gymnasium and Armory.)

CAPTAIN CONVERSE, U. S. A.

1. MILITARY DRILL. First and third terms. *M., Tu., W., 4 to 5.*

2. GALLERY PRACTISE AND DRILL REGULATIONS. Second term. *M., Tu., W., 4 to 5.*

PHYSICAL EDUCATION FOR MEN

(The Gymnasium.)

DR. WINGERT, MR. MENNE.

1. PHYSICAL EDUCATION, consisting of a graded systematic course of healthful body-building exercise and recreation, is required two hours per week during the first year of each student's residence at the University, or until he has successfully completed three terms of this work.

All first year men are required to take a physical examination at opening of the fall term.

PHYSICAL EDUCATION FOR WOMEN

(Gymnasium and Armory.)

DIRECTOR HOPKINS.

1. GYMNASIUM. Three terms. Required of all young women during the first year of their course. *M., Tu., Th., F., 9 or 11.*
2. GYMNASIUM. Three terms. Required of all young women during the second year of their course. *M., Tu., Th., F., 8 or 10.*

PHYSICS

(Physics Building, First Floor.)

PROFESSOR THOMAS, ASSISTANT PROFESSOR EARHART.

1. ELEMENTARY PHYSICS. Five credit hours. First and second terms. *M., Tu., W., F., 8 or 11.* One laboratory period per week required. Laboratory open daily, 1 to 4; *S., 8 to 11.* Assistant Professor EARHART.

Recitations and laboratory practise. Other courses in Physics may be elected by fourth-year students in Agriculture.

ROMANCE' LANGUAGES AND LITERATURES

(Office, University Hall, Room 305.)

PROFESSOR BOWEN, ASSOCIATE PROFESSOR BRUCE, ASSISTANT PROFESSOR INGRAHAM, ASSISTANT PROFESSOR PEIRCE, MISS HASKELL.

FRENCH

1. ELEMENTARY FRENCH. Four credit hours. Three terms. Grammar: Fraser and Squair's or Grandgent's Essentials. Reader; Aldrich and Foster's, or Bowen's First Scientific French Reader. Sec. I, *M., Tu., Th., F., at 9* (Arts only); Sec. II, and III, *M., Tu., Th., F., at 10*; Sec. IV, *M., Tu., Th., F., at 11* (Agr. and Eng. only); Sec. V, and VI, *Tu., W., Th., F., at 2*; Sec. VII, *Tu., W., Th., F., at 3.*

Historical and narrative prose; one or more prose comedies. In this course the study of the language is taken up from the beginning. Stress is laid upon the acquisition of a correct pronunciation, after which the entire energy of the student is directed toward the attainment of a full and accurate reading knowledge of the language. Grammar and composition are made to contribute to this end. Sight reading is emphasized.

2. MODERN FRENCH LITERATURE. Four credit hours. Three terms. Open to those who have completed course I, or who have received credit for French as an entrance subject. Sec. I, *M., Tu., Th., F., at 10*; Sec. II, *M., Tu., Th., F., at 11*; Sec. III, *Tu., W., Th., F., at 1*.

The study of the literature as such is now taken up. The work of the year covers a survey of two or more of the following subjects: (1) Contes; (2) Novels (Balzac or Hugo); (3) Lyric Poetry (Bowen's Modern French Lyrics or Canfield's French Lyrics); (4) Romantic Drama (Hugo). Prose Composition. Lectures supplement the work; private reading required; systematic attention given to syntax and idiom.

SPANISH

1. ELEMENTARY SPANISH. Four credit hours. Three terms. Sec. I, *M., Tu., Th., F., at 9*; Sec. II, *M., Tu., Th., F., at 11*; Sec. III and IV, *Tu., W., Th., F., at 2*. Assistant Professor INGRAHAM.

Grammar: (Edgren's or Hills and Ford's), and Reader (Ingraham's Victoria); Narrative Prose and Plays. Composition and conversation.

2. MODERN SPANISH LITERATURE. Four credit hours. Three terms. Open to those who have completed course I, or who have received credit for Spanish as an entrance subject. *Tu., W., Th., F., at 3*. Assistant Professor INGRAHAM.

The Modern Novel and Drama. Lectures covering a survey of the literature. Composition and conversation continued.

RURAL ECONOMICS

(Townshend Hall.)

PROFESSOR PRICE.

The subject of Rural Economics has received comparatively little attention until recently by American agricultural colleges and, at the present time, there is little uniformity in the treatment of the subject in the different institutions in which it is offered. The department includes instruction in Farm Management, History of Agriculture, and Agricultural Economics.

The facilities offered for the study of Farm Management include the University farm, containing over three hundred acres, and the records that have been kept of its operations for many years. Adjoining Columbus, and with-

in reach by electric cars, there are many well equipped and well managed farms, which are frequently visited by classes in this department.

For the study of the History of Agriculture and Agricultural Literature, the University Library offers excellent facilities in the large number of agricultural works which it contains and the complete files of agricultural periodicals.

In the study of Agricultural Economics access is had to the State Library, as well as the University Library, and excursions are made in the state to investigate agricultural conditions.

2. FARM MANAGEMENT. Four credit hours. First term. *M., Tu., Th., F., at 11.* Professor PRICE.

Lectures and recitations upon the problems of farm management, the relative profits of different systems of farm management, and their effect upon maintaining the fertility of the land. The business of farming from the standpoint of the individual is studied.

4. HISTORY OF AGRICULTURE AND LITERATURE OF AGRICULTURE. Four credit hours. Second term. *M., Tu., Th., F., at 11.* Professor PRICE.

Lectures and recitations upon the history of Agriculture and the evolution of agricultural methods, with special reference to the agriculture of the present day. The development of agricultural literature, together with literature of the present and current periodicals, are studied.

6. AGRICULTURAL ECONOMICS. Four credit hours. Third term. *M., Tu., Th., F., at 11.* Professor PRICE.

Lectures and recitations upon the production, distribution, transportation, and marketing of agricultural products. The relation of the industry of agriculture to other industries, co-operation in agriculture, agricultural organizations, and the social conditions of agriculture are considered.

SHOP WORK

(See Industrial Arts.)

SPANISH

(See Romance Languages.)

VETERINARY MEDICINE

(Veterinary Laboratory.)

PROFESSOR WHITE, PROFESSOR SISSON.

Students in Agriculture taking required or elective work in Veterinary Medicine can avail themselves of the whole equipment of the College of Veterinary Medicine. For the class room work a large number of papier-mache models, wet and dry anatomical specimens, sample horseshoes, charts, diagrams and drawings, surgical instruments, and apparatus are constantly employed to supplement text-book teaching. The Veterinary Hospital affords excellent facilities for the care and treatment of diseased and injured animals.

The new Veterinary Laboratory Building is especially designed for the teaching of Veterinary Medicine. It contains the Veterinary Museum, probably the largest in the country, a modern sanitary dissecting room, and laboratories for Anatomy, Pharmacology, Pathology, and Bacteriology.

28. VETERINARY ANATOMY. Four credit hours. First term. Recitations, *M., Tu., Th.*, at 10; demonstrations, *Th.*, 1 to 4. Professor SISSON.

Brief outline of the anatomy of the horse and ox.

29. VETERINARY PRACTISE. Four credit hours. Second term. Recitations, *M., Tu., Th.*, at 10; practicums, *Th.*, 2 to 4. Professor WHITE.

The more common diseases of a non-infective character, to which farm animals are subject. Minor surgery, castration, and the principles of horseshoeing are included in this course.

30. VETERINARY PRACTISE. Four credit hours. Third term. Recitations, *M., Tu., Th.*, at 10; practicums, *Th.*, 2 to 4. Professor WHITE.

The most common infectious and contagious diseases affecting farm and dairy animals, and the most scientific methods of preventing, dealing with, and treating the same.

17. DISEASES OF THE COW. Three credit hours. Special Dairying, second term. *W., Th.*, at 3; *S.*, at 9. Professor WHITE.

Lectures and demonstrations upon the following: (a) Anatomy of the cow, with special references to the digestive, reproductive, and milk-producing organs; (b) The more common non-infectious

diseases of these organs and their treatment; (c) Most important infectious and contagious diseases and methods of preventing and dealing with them; (d) Practical methods of administering medicines, securing during operations, casting, etc.

ELECTIVES.

Veterinary Medicine (11, 12, 13), Anatomy, first, second, and third terms. Veterinary Medicine (14, 15, 16), General Pathology and Theory and Practise, five times a week throughout the year. This course should be preceded by Veterinary Medicine (11, 12, 13) and by Physiology (14). Veterinary Medicine (19), Horse, Cattle, and Dog Clinic in the Veterinary Hospital, daily 2 to 4; Saturdays, 10 to 12, first, second, and third terms. Veterinary Medicine (21), Infectious and Contagious Diseases, first term. Veterinary Medicine (23), Obstetrics, second term. Veterinary Medicine (26), Principles of Horseshoeing, first term.

ZOOLOGY AND ENTOMOLOGY

(Biological Hall, Rooms 3, 4, 7, 8, and 9.)

PROFESSOR OSBORN, ASSOCIATE PROFESSORS HINE AND LANDACRE.

Work in this department is largely on the laboratory plan, the effort being to have each student become familiar with typical forms of animal life, acquire the power to discover facts for himself, and use them in practical applications. Animals that have an important economic relation are used as examples for their respective groups. While the aim is to give a thorough and sound training in the underlying principles of Zoology and Entomology, the practical bearing of these is shown by use of such forms as the liver fluke of sheep to show effects and relations of parasitism, the earth-worm in its relation to soil formation, trichina as affecting human health and meat exports, insects, both useful and injurious, fishes as a source of food, relation of birds to insect control and importance of certain groups of birds and mammals as the source of our domestic animals. Advanced and graduate courses provide for training in methods of research, and especial attention is given to preparation for investigation as experiment station workers.

1. INVERTEBRATE AND VERTEBRATE. Three credit hours. Invertebrate, first and second terms; Vertebrate, third term. *M., F., at 10;*

M., or W., or F., 1 to 3. Professor OSBORN, Associate Professor LANDACRE.

This course includes a general discussion of groups, dissection of types and an outline of classification. Especial attention is given to forms of economic importance either from their detrimental effects on crops, stock, etc., or from their utility in various industries or as domestic species.

3. ECONOMIC ENTOMOLOGY. Two and one-half credit hours. Third term. *Tu., Th., at 11*; laboratory, time to be arranged. Prerequisite, Course (4). Associate Professor HINE.

Insects of forest, orchard, and garden. A detailed study of injurious species intended particularly for students of Horticulture. The work includes field studies, collections, reports on observation, etc.

4. ECONOMIC ENTOMOLOGY. Three credit hours. Three terms. Lecture, *M., at 9*; *Tu., at 10*; laboratory, *W., or F., 8 to 10*. Prerequisite, Course 1. Associate Professor HINE.

A systematic study of groups of insects with special reference to injurious and beneficial species. A foundation is laid for special study in Entomology. Preparation of collections, essays, life studies and use of remedial measures along with laboratory studies on general anatomy.

7. SYSTEMATIC AND PRACTICAL ENTOMOLOGY. Three credit hours. Short course in Agriculture, third term. Two lectures and one laboratory period a week. Time to be arranged. Associate Professor HINE.

8. PARASITES OF DOMESTIC ANIMALS. One credit hour. First term. Elective. Time to be arranged. Professor OSBORN.

A lecture course devoted to the principal parasites affecting domestic animals, intended especially to meet the needs of those who intend to give particular attention to stock raising.

9. SPECIAL ENTOMOLOGY. Four credit hours. First term. Elective in Junior or Senior year. Time to be arranged. Professor OSBORN.

Studies of life histories, collection, and classification in selected groups. Field work and lectures.

10 SPECIAL ENTOMOLOGY. Four credit hours. Second term. Elective in Junior or Senior year. Time to be arranged. Professor OSBORN.

Studies of winter condition of insects. Insecticides, insecticide machinery, methods of preparing insect illustrations, greenhouse pests, etc.

11. SPECIAL ENTOMOLOGY. Four credit hours. Third term. Elective in Junior or Senior year. Time to be arranged. Professor OSBORN.

Investigations of selected groups or species. Lectures on insect legislation, distribution, natural enemies, special methods of control, etc.

[Courses 9, 10, and 11 are intended as practical courses in entomological research, adapted especially for those who wish to give special attention to this branch with reference to future work in Agriculture or Horticulture, and to furnish a preparation for those who have in view work as entomological investigators in experiment stations or as teachers in agricultural schools. They may be taken as graduate courses if not elected earlier, or continued as special lines of research during a graduate course embracing other special subjects.]

26. ZOOLOGICAL SEMINAR. One credit hour. Three terms. Time to be arranged. Professor OSBORN, Associate Professors LANDACRE and HINE.

Discussion of recent literature in Zoology and Entomology, reviews of progress in certain lines of investigation and presentation of research studies. Advanced students in Zoology and Entomology are expected to elect this course, and it is open to others who have had preliminary courses.

REGISTRATION AND EXPENSES

Students will be required to register Tuesday, September 17, 1907, and class work in all departments will begin the following day. Former students who fail to register as above will be charged one dollar, in addition to the usual incidental fee, for the first day of delinquency, and fifty cents additional for each subsequent day.

COLLEGE DUES

Each student is required to pay an incidental fee of six dollars a term.

A laboratory fee of one dollar per term is charged in all courses in which laboratory work is given, and students are required to pay for materials used in laboratories in addition to the laboratory fees.

The gymnasium is free to all students, but those desiring a locker will be charged a fee of one dollar a term.

All term dues must be paid at the opening of each term as a condition of admission to classes.

A fee of five dollars to cover expenses of graduation, diplomas, etc., is required of each person receiving one of the ordinary degrees from the University, and this fee must be paid before the degree is conferred.

OTHER EXPENSES

There are two dormitories on the University grounds for the use of students. Each occupant is charged by the University a rent of a dollar and a half a term.

The South Dormitory affords unfurnished rooms for students who desire to board themselves, and thus to reduce their expenses to a minimum. The expense of living this way is about two dollars per week. Applications for rooms should be made to the President of the University.

The North Dormitory* will accommodate sixty students for rooms and one hundred for table board. Board, furnished rooms, fuel, light and washing are, at present, supplied for about three dollars and fifty cents a week. Students will only be admitted on recommendation by the President of the University.

Boarding clubs are also formed in the neighborhood of the University. Furnished rooms are rented at seventy-five cents to one dollar and twenty-five cents a week for each student, and the cost of table board is two and one-half dollars to four dollars a week.

Board with furnished rooms can be obtained in private families, within convenient distances of the University, at rates varying from four dollars to five dollars a week.

The uniform with which the members of the battalion are required to provide themselves costs (without overcoat) about fourteen dollars. It is quiet in pattern, and is designed to be worn daily in place of civilian dress.

*Closed for the present.

The expenses of a student in the University for a year may be estimated as follows, excluding clothing (except uniform) and traveling expenses:

	Low.	Average.	High.
Incidental fees	\$18 00	\$18 00	\$18 00
Laboratory materials ..	10 00	15 00	25 00
Books and stationery ..	15 00	25 00	40 00
Room	4 50	37 00	75 00
Furniture	10 00
Board	75 00	115 00	175 00
Uniform	14 00	14 00	14 00
	<hr/>	<hr/>	<hr/>
	\$146 50	\$224 00	\$347 00

The second and third estimates for room include light, fuel, and care. The third estimate is for a room occupied by a single student. The requirements for laboratory fees and books depend upon the course of study pursued. There is no need of a student spending more than the "average" for items mentioned, many spend less.

FREE SCHOLARSHIPS

A free scholarship, good for two years in the College of Agriculture and Domestic Science, is granted to one student annually from each county in Ohio, but not more than two scholarships can be in force at any one time from any county.

Each scholarship is valid for two years from its grant, and covers incidental and fixed laboratory fees. In the chemical laboratories a student holding a free scholarship shall be required to pay for materials used and to make a deposit to cover breakage the same as other students. In case of other than new students the scholarship will be accepted only after approval by the Board of Trustees. All scholarships must be presented to the Secretary of the Board of Trustees on or before November 1st of the year in which they are to be used, otherwise they are not valid.

The free scholarship cannot be used in the special winter term courses. The appointments are made by the County Boards of Agriculture, and are not transferable by the appointees. To learn whether the scholarship of a given county for the current year has been granted, inquiry should be addressed to the Secretary or President of the County Agricultural Society. For further information concerning these scholarships, inquiries should be addressed to the Dean of this College.

CHRISTIAN ASSOCIATIONS

The Young Men's Christian Association has come to occupy a prominent place in university life. It has a membership of four hundred and forty-eight men, and is affiliated with the World's Student Christian Federation.

The Association House furnishes free for the use of its members a reading room, library, magazines and papers, piano, and telephone—a college home.

Religious meetings are held for men on Sunday afternoon; there are also frequent meetings for the promotion of social intercourse and good fellowship. Courses in systematic Bible study and in modern missions are offered. A most helpful feature of the work is that in the interest of new students at the opening of the school year. Desirable rooms and boarding places are found and posted for reference at the Association House. Representatives of the Association meet the trains, assist students in finding satisfactory locations, and endeavor in every way to make them feel at home. The Employment Bureau helps to find work.

A copy of the Students' Handbook, giving information about Columbus, the University, and the various college organizations and activities, will be sent free to prospective students.

For this handbook or for further information, address the General Secretary of O. S. U. Y. M. C. A., 239 West Tenth avenue, Columbus, Ohio.

The Young Women's Christian Association holds religious meetings regularly at noon on Tuesdays. This organization is active and efficient in working for the higher interests of the young women. Young women planning to enter the University are invited to correspond with reference to board or rooms with the General Secretary, O. S. U. Y. W. C. A., University Hall, Columbus, Ohio.

SELF SUPPORT

There is a large amount of work on the University farm and campus and in the gardens, orchards, and green-houses, which can be done by students, for which they are paid at current rates for such labor, and each year several thousand dollars are paid out in this way. By this means, together with what can be earned by steady labor during the summer vacation, a considerable number of students defray all their expenses.

Preference is given to students who are willing to devote a certain number of hours each day to the work assigned.

Work cannot be promised to all applicants, and is not guaranteed to any.

Applications for employment should be made to the Superintendent of the University farm. Labor blanks will be furnished upon request.

CADET SERVICE

Under the law of Congress establishing the University, it is required that instruction shall be given in military science and tactics, and the Trustees have directed that all male students, except those in the College of Law, and such others as may be specially excused for physical disability or for having reached the age limit of twenty-five years, shall render two years of cadet service as a condition of graduation. A uniform has been prescribed, with which each member is required to provide himself.

PHYSICAL EDUCATION

Physical Education is conducted under the direct supervision of the Director, who is a practising physician and a member of the University Faculty. He is assisted by an associate director for women, also an assistant and twenty student aids, who are selected each year from the upper classmen and those who show proficiency in their work. The main floor of the gymnasium (80 by 150 ft.) is thoroughly equipped with the most modern gymnastic apparatus. It is used by the women in the forenoon while the men exercise in the new gymnasium on the first floor. In the afternoon the main floor is used exclusively by the men for class work, athletics, basket ball, recreative games, etc. Regular class exercise two hours per week is required during the first year of a student's residence at the University or until he has successfully completed three terms of this work. A thorough physical examination is made of each student at the opening of the college year. Physical defects, abnormalities and weaknesses are noted and judicious, healthful exercise is prescribed to fit the student's individual needs.

AMOUNT OF WORK

No student is permitted to take less than fifteen credit hours a week of any sort of work, except by special permission, and no student will be permitted to take more than the regular work of the class to which he belongs who has not passed all his work for the preceding term. A credit hour means one hour class room work in lecture, recitation, or quiz, or two to three hours of laboratory work.

At the close of any term a student failing to pass in two-thirds of his work will be considered on probation, during which time a second similar failure will forfeit his connection with the University.

THESIS

As requisite for graduation, each candidate must present an acceptable thesis, embodying the results of a special

study. The subject of this study must lie within field of the degree sought. The subject must be announced to the President of the University (dependent upon the approval of the head of the Department), not later than December 15 of the fourth year, and the completed thesis must be presented on standard paper of specified size and quality, typewritten, bound, and titled, not later than the second Saturday before Commencement Day.

The Ohio State University Bulletin is published fifteen times during the academic year, as follows: Monthly in October, November, and June, and bi-weekly in December, January, February, March, April, and May.

Ohio State University Bulletin

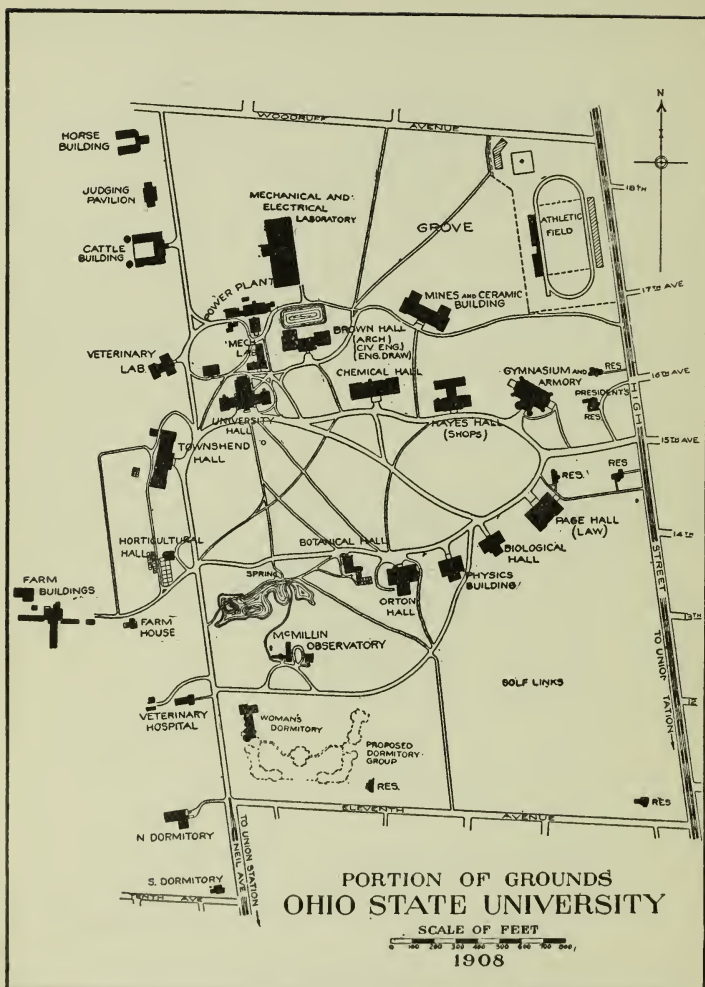
College of Agriculture and Domestic Science



January 30, 1908.

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OHIO STATE UNIVERSITY

The Ohio State University, located in Columbus two miles north of the Union Station, is a part of the public educational facilities maintained by the State. It comprises seven colleges:

The College of Agriculture and Domestic Science,
The College of Arts, Philosophy, and Science,
The College of Education,
The College of Engineering,
The College of Law,
The College of Pharmacy,
The College of Veterinary Medicine.

This bulletin of announcements is devoted exclusively to the work of the College of Agriculture and Domestic Science.

(NOTE.—In requesting any of the announcement bulletins of the University, address the University Editor, Ohio State University, Columbus, Ohio.)

UNIVERSITY CALENDAR

1908

Entrance examinations, (8 a. m.) Tuesday to Saturday,
June 16 to 20.

Summer term, June 22 to August 14.

Entrance examinations, (8 a. m.) Tuesday to Saturday,
September 15 to 19.

First term begins—Registration Day—Tuesday, September 22.

President's Annual Address, (11 a. m.) Friday, September 25.

Latest date of admission to candidacy for a degree at the
Commencement of June, 1909, Thursday, October 1.

Thanksgiving recess, November 27 and 28.

Latest date for filing thesis subject, Tuesday, December 15.

First term ends, Wednesday, December 23.

CHRISTMAS VACATION

1909

Second term begins—Registration Day—Tuesday, January 5.

Washington's Birthday, Monday, February 22.

Second term ends, Friday, April 2.

SPRING RECESS

Third term begins—Registration Day—Wednesday, April 7.

Field Day—Athletic Association—Saturday, May 8.

Competitive Drill—Cadet Regiment—Saturday, May 22.

Final examinations, Friday to Thursday, June 11 to 17.

Latest date for presenting thesis, Saturday, June 12.

Entrance examinations, (8 a. m.) Tuesday to Saturday,
June 15 to 19.

Latest date for filing bound copy of thesis, Friday, June 18.

Commencement, Wednesday, June 23.

COLLEGE OF AGRICULTURE AND DOMESTIC SCIENCE

The College of Agriculture and Domestic Science offers seven distinct courses of study:—

1. A four-year course in Agriculture.
2. A four-year course in Horticulture and Forestry.
3. A two-year course in Agriculture.
4. A two-year course in Horticulture.
5. A special course in Dairying.
6. A ten-weeks winter course in Agriculture.
7. A four-year course in Domestic Science.

The four-year courses of this College are regular collegiate courses of the University and lead to the degrees of Bachelor of Science in Agriculture, Bachelor of Science in Horticulture and Forestry, and Bachelor of Science in Domestic Science. The requirements for admission to these courses are given in the following pages.

The short courses are for students who are not so well prepared and are unable to spend four years in the University. It has been found that one year of the short course often prepares a student for the four-year course, and that a large proportion of those who enter the short courses find time and means to continue one of the four-year courses.

FACULTY AND INSTRUCTORS

WILLIAM OXLEY THOMPSON, D. D., LL. D., PRESIDENT of the University.

HOMER CHARLES PRICE, M. S. A., DEAN, Professor of Rural Economics, and Manager of University Farm.

ALFRED VIVIAN, Ph. G., SECRETARY, Professor of Agricultural Chemistry.

WILLIAM RANE LAZENBY, M. Agr., Professor of Horticulture and Forestry.

HENRY ADAM WEBER, Ph. D., Professor of Agricultural Chemistry.

GEORGE WELLS KNIGHT, Ph. D., Professor of American History and Political Science.

ALBERT MARTIN BLEILE, M. D., Professor of Anatomy and Physiology.

WILLIAM ASHBROOK KELLERMAN, Ph. D., Professor of Botany.

*JOSEPH VILLIERS DENNEY, A. B., Professor of English.

WILLIAM MCPHERSON, Ph. D., Professor of Chemistry.

DAVID STUART WHITE, D. V. M., Professor of Veterinary Medicine.

HERBERT OSBOBN, M. Sc., Professor of Zoology and Entomology.

FRANK EDWIN SANBORN, S. B., Professor of Industrial Arts.

JOHN ADAMS BOWNOCKER, D. Sc., Professor of Inorganic Geology.

CHARLES SUMNER PLUMB, B. Sc., Professor of Animal Husbandry.

SEPTIMUS SISSON, B. Sc., V. S., Professor of Comparative Anatomy.

LEWIS A. RHOADES, Ph. D., Professor of Germanic Languages and Literatures.

CHARLES BRADFIELD MORREY, B. A., M. D., Professor of Bacteriology.

JAMES EDWARD HAGERTY, Ph. D., Professor of Economics and Sociology.

THOMAS EWING FRENCH, M. E., Professor of Engineering Drawing.

ARTHUR GILLET McCALL, B. Sc. (Agr.), Professor of Agronomy.

OSCAR ERF, B. Sc., (Agr.) Professor of Dairying.

FREDERICK RUPERT MARSHALL, B. S. A., Professor of Animal Husbandry.

RUTH AIMEE WARDALL, M. A., Professor of Domestic Science.

GEORGE WASHINGTON MCCOARD, M. A., Associate Professor of Mathematics.

CHARLES A. BRUCE, B. A., Associate Professor of Romance Languages.

*JOHN H. SCHAFFNER, A. M., M. S., Associate Professor of Botany.

JAMES STEWART HINE, B. Sc., Associate Professor of Entomology.

FRANCIS LEROY LANDACRE, B. A., Associate Professor of Zoology.

VIRGINIA BABB, B. D., Associate Professor of Domestic Art.

V. M. SHOESMITH, B. Sc., Associate Professor of Agronomy.

CHARLES LINCOLN ARNOLD, M. Sc., Assistant Professor of Mathematics.

VERNON HAYES DAVIS, M. S. A., Assistant Professor of Horticulture and Forestry.

EDGAR S. INGRAHAM, Ph. D., Assistant Professor of Romance Languages.

*Absent on leave, 1907-1908.

ROBERT F. EARHART, Ph. D., Assistant Professor of Physics.

JOSEPH NELSON BRADFORD, M. E., Professor of Architecture.

EMILY E. BRACKEN, Professor of Art.

DAVID R. MAJOR, Ph. D., Professor of Psychology.

GEORGE L. CONVERSE, Captain U. S. A., Professor of Military Science and Tactics.

OLIVE JONES, A. B., Librarian.

H. S. WINGERT, M. D., Director of Physical Education for Men.

BERTHA HOPKINS, B. Ph., Director of Physical Education for Women.

A. B. GRAHAM, Superintendent of Agricultural Extension.

BERTHOLD AUGUST EISENLOHR, B. Ph. Assistant Professor of the Germanic Languages and Literatures.

WILLIAM LUCIUS GRAVES, M. A., Assistant Professor of English.

GEORGE H. MCKNIGHT, Ph. D., Assistant Professor of English.

WILLIAM¹ LLOYD EVANS, Ph. D., Assistant Professor of Chemistry.

CARSON SAMUEL DUNCAN, M. A., Assistant Professor of English.

GEORGE DAVID HUBBARD, Ph. D., Assistant Professor of Geology.

JOHN B. PRESTON, M. A., Assistant Professor of Mathematics.

J. WARREN SMITH, M. Sc., Lecturer on Meteorology.

WILLIAM H. RENCK, Instructor in Pattern Making and Founding.

CHARLES P. CROWE, Instructor in Forging.

E. S. GUTHRIE, Instructor in Buttermaking.

A. B. NYSTROM, B. Sc. (Agr.), Instructor in Dairy Mechanics.

W. H. FREUND, Instructor in Cheesemaking.

R. H. WILLIAMS, M. S., Assistant in Animal Husbandry.

WILLIAM JOSEPH DAVIS, B. Sc. (Agr.), Assistant in Agricultural Chemistry.

R. L. SHIELDS, B. Sc. (Agr.), Assistant in Agricultural Extension.

G. R. HYSLOP, B. Sc. (Agr.), Assistant in Agronomy.

JOHN CHISHOLM, Superintendent of the University Farm.

ADMISSION

Applicants for admission must be at least sixteen years of age. The College is open on equal terms to both sexes.

UNIVERSITY ENTRANCE BOARD

The admission of students is in charge of the University Entrance Board, which determines the credits which shall be issued on all entrance examinations and certificates, and furnishes all desired information to applicants. Correspondence relating to admission should be addressed to the Entrance Board, Ohio State University, Columbus.

ADMISSION TO THE COURSE LEADING TO A DEGREE

There are two modes of admission to the course leading to a degree: (a) by certificate, (b) by examination.

ADMISSION BY CERTIFICATE

Applicants may be admitted to the four-year course in Agriculture and to the four-year course in Horticulture and Forestry for the year 1908-1909* without examination on presentation of properly endorsed certificates from any first or second grade high school in this state or from approved normal schools or from the State Board of School Examiners or from any school outside of the state which is recognized by the University, under the following provisions:

(a) If from secondary schools, the certificate must show that the applicant is a graduate in good standing of the school issuing it; and also must state in detail the studies

*It is the intention of the University to have all the first and second grade high schools in the state inspected as rapidly as possible, with the idea of preparing a list of schools recognized for these courses. For the year 1908-1909, however, all first and second grade schools will be recognized for the courses in Agriculture and in Horticulture and Forestry.

pursued, the text-books used, the amount of work done in each study, the amount of time devoted to it, and the fact that the applicant has passed in the work.

(b) Any entrance requirement not covered by a certificate must be met by examination.

Blank certificates may be obtained by addressing the Secretary of the Entrance Board. Certificates should be filled out and returned to the University as early as possible after the close of schools in June. Since errors are frequently made in transcribing the record upon the blank form, the candidate should verify his certificate and see that it gives him credit for all his school work.

Applicants to be admitted to the course in Domestic Science without examination, must present properly endorsed certificates from such secondary schools as have been accredited* or recognized by the University or from approved normal schools or from the State Board of School Examiners, subject to the provisions above stated.

ADMISSION BY EXAMINATION

The Entrance Board will conduct entrance examinations June 11 to 15 and September 10 to 14, 1908. A part of the examinations may be taken in June and the remainder in September. All applicants for admission who can not conform to the requirements for admission by certificate, must take examinations for admission.

SCHEDULE.—Examinations will be from 8 to 12 a. m. and from 1 to 5 p. m.

TUESDAY

A. M.—Greek and Roman History, English History, General History.

P. M.—Composition and Rhetoric, Classics, Chemistry, Geology.

*Regarding accredited and recognized schools, see page 78, and following.

WEDNESDAY

A. M.—Algebra, German, English Grammar, Descriptive Geography.

P. M.—Plane Geometry, Physical Geography, Arithmetic.

THURSDAY

A. M.—Civics, Solid Geometry, Zoology.

P. M.—Beginning Latin, Cæsar, Astronomy.

FRIDAY

A. M.—Physics, Physiology, Botany.

P. M.—U. S. History, French, English Literature.

SATURDAY

A. M.—Virgil, Cicero.

REQUIREMENTS BY UNITS*

Applicants to be admitted to full standing must obtain credit by examination or certificate for twelve units, chosen from the five groups which follow, subject to the restrictions stated therein.

No applicant will be admitted with total conditions in excess of two units, not counting the requirements in group E, but in no case with conditions amounting to more than three units.

(A) ENGLISH GROUP

Two units are required in this group.

English Composition and Rhetoric..... 1 unit

English Classics 1 unit

English Literature 1 unit

(B) HISTORY GROUP.

Two units are required in this group.

Civil Government $\frac{1}{2}$ unit

United States History..... $\frac{1}{2}$ or 1 unit

Mediaeval and Modern or General

History $\frac{1}{2}$ or 1 unit

Greek and Roman History..... $\frac{1}{2}$ or 1 unit

English History $\frac{1}{2}$ or 1 unit

*A unit is a course of study covering a school year of not less than thirty-two weeks, with four or five periods per week.

(C) MATHEMATICS GROUP

Two units are required in this group, consisting of Algebra (through quadratics) and Plane Geometry.

Algebra (through quadratics).....	1 unit
Algebra (beyond quadratics).....	$\frac{1}{2}$ unit
Geometry (plane)	1 unit
Geometry (solid and spherical).....	$\frac{1}{2}$ unit

(D) SCIENCE GROUP

Two units are required in this group, including Physics and Botany.

Physics	1 unit
Physical Geography	$\frac{1}{2}$ or 1 unit
Botany	$\frac{1}{2}$ or 1 unit
Chemistry	1 unit
Physiology	$\frac{1}{2}$ unit
Zoology	$\frac{1}{2}$ or 1 unit
Elements of Agriculture.....	$\frac{1}{2}$ unit

(E) FOREIGN LANGUAGE GROUP

Two units are required in this group; and two additional units from this or the preceding groups.

Latin	2, 3, or 4 units
Greek	2, 3, or 4 units
German	2, 3, or 4 units
French	2, 3, or 4 units
Spanish	2, 3, or 4 units

A single unit in a foreign language will not be counted toward entrance.

The extent and character of the work required in each subject mentioned above is described on page 72, and following.

ADMISSION WITH ADVANCED STANDING

Applicants who have completed at least one year's work in an approved college, and who bring official and explicit certificates describing their courses of study and scholarship, and letters of honorable dismissal, will be admitted in accordance with either of two plans:

(1) The entrance units on which the candidate was admitted to the approved college will be accepted at their

face value; deficiencies will be made up from the college credits presented, and advanced credit will be given for any remaining, satisfactory work; or

(2) One year's work will be accepted in lieu of entrance units and the candidate will be admitted without examination and without conditions, but without any advanced standing on the year's work.

Applicants who have completed less than one year's work in an approved college will be given credit for satisfactory work provided they can meet the regular entrance requirements.

REQUIREMENTS FOR SHORT COURSES

No examinations will be required for the two-year courses in Agriculture or Horticulture, but the applicant must be at least seventeen years of age and must satisfy the Entrance Board that he has had practical experience in agriculture or horticulture.

GRADUATE STUDY

Graduates of this College or of other institutions of approved standing may take graduate work in any of the departments of this College. Such students shall elect a major and minor subject and submit to the Graduate Committee of this College an outline of their course of study with the approval of the heads of the departments in which the work is to be taken. Upon the completion of one year's residence, which is devoted wholly to the completion of the course of study approved by the Graduate Committee, and the presentation of an acceptable thesis upon some subject connected with the major elective, the degree of Master of Science in Agriculture will be conferred.

COURSES OF STUDY

AGRICULTURE

The course in Agriculture is one of a number of regular four-year collegiate courses in the University. It is designed not only to make specially trained agriculturists, but also educated men. The course pre-supposes that a young man has had a High School training, or its equivalent, and that he has had the training in farm matters that usually comes to a young man who has lived on a farm. It supplements this training but does not repeat it. The technical training in this course consists of those matters which years of experience in teaching have shown are either lacking or most necessary. Young men from the cities are entering this course, as they should do if they expect to engage in agricultural pursuits, but it should be understood that the course in Agriculture does not, except incidentally, supply that training in farm matters which comes from actual life upon the farm. Such a course could be readily planned, but it would waste the valuable time of nine-tenths of the students who now enter the course.

The officers of the College recognize the danger of a too special or technical training of under-graduate students in a subject having such a wide scope and one requiring for its successful prosecution such breadth of knowledge as Agriculture. A careful examination of the course as outlined will show that about one-third of the time of the student during the four years is, or may be, devoted to language (English and foreign), history, and economics, about one-third to pure science, and one-third to technical or professional training. Electives in the junior and senior years allow the student, if he chooses, to specialize in Animal Husbandry, Agronomy, Dairying, Rural Economics, Agricultural Chemistry, Bacteriology, Botany, or Entomology.

No man or woman is well educated until he or she has been taught both to do and to think. Both faculties are necessary and each assists the other. Experience and reason, however, show that the students who enter the course in Agriculture have been better trained in doing than in thinking. With them manual training is not as necessary as an educational factor as with students from the cities. However, special emphasis is laid on training the faculties of observation, reason, and judgment. The laboratory methods and facilities are most thorough and complete in all scientific and technical courses, giving a training which is impossible to obtain merely from books.

COURSE IN AGRICULTURE

Degree—Bachelor of Science in Agriculture.

NOTE.—The figure in parenthesis following the name of each subject indicates the number of that subject in its department, the other figure the number of credit hours. For full description of the courses, see corresponding numbers under the departments of instruction.

FIRST YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Chemistry (7 or 44) Inorganic.	4. Chemistry (7 or 44) Inorganic.	4. Chemistry (12) Qualitative. 4.
Zoology (1) Invertebrate.	3. Zoology (1) Invertebrate.	3. Chemistry (42) Organic. 2.
English (1) Paragraph Writing.	2. English (1) Paragraph Writing.	2. Zoology (1) Vertebrate. 3.
An. Husbandry (23) Cattle and Sheep.	4. An. Husbandry (24) Horses and Swine.	4. English (1) Paragraph Writing. 2.
Drawing (10)	3. Shopwork (2)	3. An. Husbandry (26) Dairy Cattle. 4
		Shopwork (1) 3.
Cadet Service	1. Cadet Service	1. Cadet Service 1.
Gymnasium.	Gymnasium.	Gymnasium.

SECOND YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Agronomy (2) Farm Equipment.	4. An. Husbandry (6) Principles of Breeding.	4. Agronomy (22) Crops.
Agr. Chem. (13)	5. Agr. Chem. (13)	5. Agr. Chem. (13)
Botany (6)	4. Botany (7)	4. Botany (8)
Physiology (1)	3. Physiology (1)	3. Physiology (1)
Zoology (4) Entomology.	3. Zoology (4) Entomology.	3. Zoology (4) Entomology.
Cadet Service	1. Cadet Service	1. Cadet Service

THIRD YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Geology (2) General.	5. Geology (5) Applied.	4. Agronomy (12) Soils.
Dairying (12)	4. Horticulture (6)	4. Horticulture (3)
Modern Language French, German, or Spanish.	4. Modern Language French, German, or Spanish.	4. Modern Language French, German, or Spanish.
	Astronomy (3)	2.

And one of the following:

An. Husbandry (2) 4. Breeds of Live Stock.	An. Husbandry (8) 4. Feeding.	An. Husbandry (4) 4 Breeds of Live Stock.
Vet. Medicine (28) 4.	Vet. Medicine (29) 4.	Vet. Medicine (30) 4.
Horticulture (11) 4.	Dairying (24) 4.	Dairying (26) 4.
Zoology (9) Entomology.	Zoology (10) Entomology.	Zoology (11) Entomology.
Bacteriology (5) 4.	Bacteriology (8 or 9) 4.	Bacteriology (8 or 9) 4.
Agr. Chemistry (*) 4.	Agr. Chemistry (*) 4.	Agr. Chemistry (*) 4.
Botany (*) 4.	Botany (*) 4.	Botany (*) 4.
Chemistry (46 & 47) 4.	Chemistry (46 & 47) 4.	Chemistry (46 & 47) 4.

FOURTH YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Am. History (1) or Economics (33) 3.	Am. History (1) or Economics (33) 3.	Am. History (1) or Economics (33) 3.
Rural Economics (2) 4. Farm Management.	Rural Econom. (4) 4. History of Agriculture.	Rural Econom. (6) 4. Agricultural Economics.

*Students electing Agricultural Chemistry or Botany in their junior year should consult the department interested regarding the same before being registered.

Ten hours a week throughout the year from any of the courses given in any of the colleges of the University upon which the student is qualified to enter, except the College of Law.

Two hours a week of this elective work may be devoted to a thesis, subject to the consent of the instructor under whom the thesis is to be written.

HORTICULTURE AND FORESTRY

This course was established to meet a growing demand for special education and training in the College of Agriculture. It seeks to familiarize the student with those sciences that are fundamental in Horticulture and Forestry and to give a certain amount of technical and literary training.

Among the sciences that form the natural basis of a sound, practical knowledge of Horticulture and Forestry are chemistry, physics, botany, geology, zoology, and entomology. To these a large part of the first two years of the course is devoted. In addition, one modern language, rhetoric or English composition, drawing and shopwork are required.

The last two years of the course are devoted mainly to Horticulture and Forestry proper, with some more strictly cultural studies like history or economics. A third part of the required work of the fourth year is elective, and may be chosen from any course in the University upon which the student is qualified to enter.

The primary object of the course is to teach those who desire to become fruit-growers, gardeners, nurserymen, florists, or foresters what they most need to know as a foundation for their professional work. To this end both the science and art, or the theory and practise are taught. While the sciences are invaluable in giving accurate and definite knowledge regarding the origin and growth of plants, and the composition and physical properties of the soil, they cannot tell us just how to select varieties, or how to propagate, transplant, cultivate, fertilize, prune, spray, or what is

equally essential in practise, how to harvest, store and market the product to the best advantage.

For earnest, enterprising young men and women, Horticulture and Forestry, in their various branches, offer as large a reward for intelligent, well-directed effort as any other pursuit or profession. Forestry presents an especially inviting field for young men.

Over one-half of the students who have graduated in this course, since its establishment about twelve years ago, are filling positions of honor and responsibility that command salaries ranging from fifteen hundred to two thousand dollars a year. One-half of the remainder, including some of the more recent graduates, are receiving salaries of one thousand dollars or more a year.

COURSE IN HORTICULTURE AND FORESTRY

Degree—Bachelor of Science in Horticulture and Forestry.

NOTE.—The figure in parenthesis following the name of each subject indicates the number of that subject in its department; the other figure the number of credit hours. For full description of courses, see corresponding number under the departments of instruction.

FIRST YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Chemistry (7 or 44) 4. Inorganic.	Chemistry (7 or 44) 4. Inorganic.	Chemistry (12) 4. Qualitative.
Zoology (1) 3. Invertebrate.	Zoology (1) 3. Invertebrate.	Chemistry (42) 2. Organic.
English (1) 2. Paragraph Writing.	English (1) 2. Paragraph Writing.	Zoology (1) 3. Vertebrate.
*French (1)	French (1)	English (1) 2. Paragraph Writing.
German (1) or Spanish (1) 4.	German (1) or Spanish (1)	French (1)
Drawing (10)	Shopwork (2) 3.	German (1) or Spanish (1) 4.
Cadet Service	Cadet Service 1.	Shopwork (1) 3.
Gymnasium.	Gymnasium.	Cadet Service 1. Gymnasium.

SECOND YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Horticulture (1) Elements.	4. Horticulture (2) Vegetable Forcing.	4. Horticulture (3) Plant Propagation.	4.
Agr. Chem. (13)	5. Agr. Chem. (13)	5. Agr. Chem. (13)	5.
Physiology (1)	3. Physiology (1)	3. Physiology (1)	3.
Zoology (4) Economic.	3. Zoology (4) Economic.	3. Zoology (4) Economic.	3.
Botany (6)	4. Botany (7)	4. Botany (8)	4.
Cadet Service	1. Cadet Service	1. Cadet Service	1.

THIRD YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Horticulture (5) Varieties of Fruit.	4. Horticulture (6) Principles of Fruit Culture.	4. Horticulture (14) Olericulture.	4.
Agronomy (2) Farm Equipment.	4. Geology (5) Applied.	4. Agronomy (22) Crops.	4.
Geology (2) General.	5. Horticulture (18) Apiculture.	3. Agronomy (12) Soils.	4.
French (2)	French (2)	Zoology (3) Economic.	3.
German (4)	German (4)	French (2)	
Spanish (2) or Botany (17) Forestry.	4. Spanish (2) or Botany (17) Histology of Wood.	4. German (4) Spanish (2) or Botany (17) Forest Ecology and Pathology.	4.

FOURTH YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Horticulture (8) Ornamental Plants.	2. Horticulture (9) or Window Gardening and Floriculture.	Horticulture (10) Home Gardening.	2.
Horticulture (11) Elements of Forestry.	5. Horticulture (17) Plant Variation.	Horticulture (15) Landscape Gardening.	3.
Am. History (1) or Political.	Horticulture (12) Forest Technology and Timber Physics.	5. or Hortic. (13) Forest Economics.	5.
	Am. History (1) or Political.	Am. History (1) or U. S. Political.	
Economics (33) Political.	3. Economics (33) Political.	3. Economics (33) Political.	3.

ELECTIVE

Seven hours a week through the year, chosen from any of the courses given in any college of the University upon which the student is qualified to enter, except the College of Law, two hours a week of which may be devoted to thesis, subject to the approval of the department in which the thesis is to be written.

TWO-YEAR COURSE IN AGRICULTURE

The Short Course in Agriculture is a two-year course, designed to give practical instruction in the various branches of Agriculture, and is intended primarily for those students whose previous training does not qualify them to enter the four-year course. While believing that the four-year course is none too long for the students who expect to engage in agricultural pursuits, yet it is recognized that there are many students whose circumstances make it impossible to take a four-year collegiate course in Agriculture, and yet who would be greatly benefited by taking a less extended training for their life work.

This course is especially desirable for students of rather mature age. It contains as thorough instruction as the time will admit in Agriculture, Animal Husbandry, Dairying, Horticulture (including Fruit Culture, Vegetable Gardening, and Forestry), Veterinary Medicine, Economic Entomology, Bacteriology, and the sciences underlying these subjects. The second year contains optional work so that it is possible for students to specialize in Horticulture, Agronomy, Animal Husbandry, or Dairying. The second year also contains a number of elective studies which may be taken as preparatory to the first year of the four-year course in Agriculture.

No degree is given on the completion of the work, but a certificate is issued stating fully the work done.

OUTLINE OF TWO-YEAR COURSE IN AGRICULTURE

NOTE.—The figure in parenthesis following the name of each subject indicates the number of that subject in its department; the other figure the number of credit hours. For full description of courses, see corresponding number under the departments of instruction.

FIRST YEAR

FIRST TERM	SECOND TERM	THIRD TERM
An. Husbandry (1) 4.	An. Husbandry (1) 4.	An. Husbandry (1) 4.
Horticulture (1) 4. Elementary.	Horticulture (1) 4.	Horticulture (1) 4.
Drawing (10) 3.	Shopwork (1) 3.	Shopwork (2) 3.
Chemistry (3) 4. Elementary.	Chemistry (3) 4. Elementary.	Chemistry (45) or Qualitative Analysis. Agr. Chem. (16) 4. Soil Fertility.
Cadet Service Gymnasium.	1. Cadet Service Gymnasium.	1. Cadet Service 1. Gymnasium.

SECOND YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Agronomy (2) 4. Farm Equipment.	Agronomy (11) 4. Soils.	Agronomy (22) 4. Crops.
Dairying (12) 4. Elementary.	Dairying (24) 4. Dairy Equipment.	Dairying (26) 4. Farm Dairying.
Cadet Service 1.	Cadet Service 1.	Cadet Service 1.

And two subjects each term chosen from the following:

Vet. Medicine (28) 4.	Vet. Medicine (29) 4.	Vet. Medicine (30) 4.
An. Husbandry (25) 4. Dairy Cattle.	An. Husbandry (3) 4. Stock Feeding.	An. Husbandry (5) 4. Stock Breeding.
Horticulture (19) 4. Pomology.	Horticulture (19) 4. Pomology.	Horticulture (19) 4. Pomology.
Zoology (7) 4. Entomology.	Zoology (7) 4. Entomology.	Zoology (7) 4. Entomology.
Physiology (2) 3.	Bacteriology (2) 3.	Rural Econom. (1) 4.
Mathematics (1) 5. Algebra.	Mathematics (3a) 5. Geometry.	Botany (1) 5. Elementary.
Physics (1) 5.	Physics (1) 5.	Geology (1) 5. Physical Geography.

TWO-YEAR COURSE IN HORTICULTURE

This course is intended to be to those engaged in horticultural pursuits what the two-year course in Agriculture is to those interested in farming. Practical instruction will be given in the subjects which are of interest to the fruit-growers, gardeners, nurserymen, florists, and landscape gardeners. The course is primarily for the student, who, for various reasons, cannot take the four-year course in Horticulture and Forestry and yet desires to have somewhat thorough preparation in the fundamentals of Horticulture.

No degree is given on completion of the work but a certificate is issued stating fully the work done.

OUTLINE OF TWO-YEAR COURSE IN HORTICULTURE

FIRST YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Horticulture (1)	4. Horticulture (1)	4. Horticulture (1)	4.
Zoology (7) Entomology.	4. Zoology (7) Entomology .	4. Zoology (7) Entomology.	4.
Drawing (10)	3. Shopwork (2)	3. Shopwork (1)	3.
Chemistry (3) Elementary.	4. Chemistry (3) Elementary.	4. Chemistry (45) or Qualitative Analysis. Agr. Chem. (16) Soil Fertility.	4.
Cadet Service Gymnasium.	1. Cadet Service Gymnasium.	1. Cadet Service Gymnasium.	1.

SECOND YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Horticulture (19) Pomology.	4. Horticulture (19) Pomology.	4. Horticulture (19) Pomology.	4.
Agronomy (2) Equipment.	4. Agronomy (11) Soils.	4. Agronomy (22) Crops.	4.
Cadet Service	1. Cadet Service	1. Cadet Service	1.

Not less than seven hours from the following:

Horticulture (11)	5. Horticulture (18)	3. Horticulture (15)	3.
Elements of Forestry.	Apiculture.	Landscape Gardening.	
Horticulture (8)	2. Horticulture (2)	4. Horticulture (14)	4.
Floriculture.		Vegetable Gardening.	
Mathematics (1)	5. Mathematics (3a)	5. Rural Econom. (1)	4.
Algebra.	Geometry.	Farm Management.	
Physics (1)	5. Physics (1)	5. Geology (1)	5.
		Physical Geography.	
Physiology (2)	3. Bacteriology (2)	3. Botany (1)	5.
		Elementary.	
	Meteorology (3)	2.	

WINTER COURSES

SPECIAL WINTER COURSE IN DAIRYING (Known as the Ohio Dairy School)

This course in Dairying is established to meet the wants of those who have neither the time nor means for more extended courses. It is designed especially for those who are desirous of mastering the art of butter and cheese making or who wish to become fitted for the position of manager or superintendent of a creamery or cheese factory. In this course the greater part of the time is given to the laboratory or dairy room practise. This consists in the testing of milk as to purity and content of butter fat; the use and care of centrifugal separators and other dairy devices; the making of butter and cheese by the most improved methods; in short, all the essential operations of the creamery, factory, and home dairy management are repeatedly performed under the guidance and direction of competent instructors. A special bulletin describing this course will be mailed upon application to any one interested.

WINTER COURSE IN AGRICULTURE

The ten weeks Winter Course in Agriculture has been established to meet the needs of those Ohio farmers who are unable to avail themselves of the other courses in agriculture offered by the University. There are a large num-

ber of young men located on the farms of our state who are so situated that it is impossible for them to be absent from their homes during the nine months of the college year, but yet desire some training in the principles of agriculture. On other farms are found mature men, who are past the usual school age but are ambitious to become familiar with the most recent agricultural thought and practises.

This course offers to such men an opportunity to become familiar with the results of the latest investigation in agriculture and to study the theories resulting from his research and their practical application to work on the farm.

Those interested are invited to write for the special announcement describing this course.

DOMESTIC SCIENCE

The course in Domestic Science is planned to meet the special needs of women students. Four years of regular university work are required. The department of Domestic Science stands for a liberal training of a university grade, which gives a homeward trend to the education of young women.

The course is essentially scientific in character, but a fair amount of literary, artistic, and economic training is provided. Certain courses offered in this department are electives for students who specialize along other lines of work. The prescribed course affords opportunity for a student to specialize in domestic science, and elective courses in addition to this provide training for those who wish to teach the subject.

OUTLINE OF COURSE IN DOMESTIC SCIENCE

Degree—Bachelor of Science in Domestic Science.

NOTE.—The figure in parenthesis following the name of each subject indicates the number of that subject in its department.

FIRST YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Chemistry (7 or 44) 4. Inorganic.	Chemistry (7 or 44) 4. Inorganic.	Chemistry (12) 4. Qualitative Analysis.
Art (10) 2.	Art (11) 2.	Chemistry (42) 2. Organic.
English (1) 2. Paragraph Writing.	English (1) 2. Paragraph Writing.	Art (12) 2.
Zoology (1) 3. Invertebrate.	Zoology (1) 3. Invertebrate.	English (1) 2. Paragraph Writing.
*French (1) German (1) or Spanish (1) 4.	French (1) German (1) or Spanish (1) 4.	Zoology (1) 3. Vertebrate.
Domestic Art (1) 2. Hand Craft.	Domestic Art (2) 2. Textiles.	French (1) German (1) or Spanish (1) 4.
Hygiene and Physical Training.	Hygiene and Physical Training.	Domestic Art (3) 2. Textiles. Hygiene and Physical Training.

SECOND YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Agr. Chem. (14) 5.	Agr. Chem. (14) 5.	Physiology (3) 3. Chemical.
Dom. Science (1) 4. Foods.	Dom. Science (2) 4. Foods.	Dom. Science (3) 4. Foods.
Physiology (1) 3.	Physiology (1) 3.	Physiology (1) 3.
Botany (13) 3.	Botany (13) 3.	Botany (13) 3.
Hygiene and Physical Training.	Hygiene and Physical Training.	Hygiene and Physical Training.

THIRD YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Dom. Science (4) 4. Dietetics.	Domestic Art (4) 4. History of Costume.	Domestic Art (5) 4. Household Art and Decoration.
Drawing (20) 1. Mechanical.	Drawing (15) 1½. Technical.	Drawing (15) 1½. House Designing.
French (2) German (4) or Spanish (2) 4.	French (2) German (4) or Spanish (2) 4.	French (2) German (4) or Spanish (2) 4.

*Where credit is received for elementary French, German, or Spanish, French (2) 4 hours, German (4) 4 hours or Spanish (2) 4 hours is required.

Not less than six hours from the following:

Architecture (9) History of Arch.	3. Architecture (10) History of Arch.	3. Architecture (11) History of Arch.	3.
English (8)	3. English (8)	3. English (8)	3.
Economics (33) Political Economy.	3. Economics (33) Political Economy.	3. Economics (33) Political Economy.	3.
European His. (1)	3. European His. (2)	3. European His. (3)	3.
Am. History (1) U. S. Political.	3. Am. History (1) U. S. Political.	3. Am. History (1) U. S. Political.	3.
Bacteriology (5)	4. Bacteriology (7)	4. Bacteriology (7)	4.
Drawing (14) Pen Drawing.	2. Drawing (18) Water Color.	3. Drawing (19) Water Color.	2.
Drawing (17)	2. Drawing (40) Clay Modeling.	2. Drawing (41) Clay Modeling.	2.

FOURTH YEAR

FIRST TERM	SECOND TERM	THIRD TERM
House. Eco. (10)	3. Dom. Science (11) Household Management.	3. Dom. Science (12) Teachers' Course.
Domestic Art (6) Theory and Practice.	4.	

ELECTIVE

Twelve hours a week through the year, chosen from any of the courses given in any college of the University upon which the student is qualified to enter, except the College of Law.

DEPARTMENTS OF INSTRUCTION

AGRICULTURAL CHEMISTRY

(Townshend Hall)

PROFESSOR VIVIAN, PROFESSOR WEBER, MR. DAVIS

The department of Agricultural Chemistry occupies the greater part of the second floor of Townshend Hall. The main students' laboratory is at present fitted up with one hundred and fifty desks, and will accommodate over two hundred students. Each desk contains a complete outfit of apparatus and chemicals necessary for the work in hand. Special apparatus and chemicals are supplied from the store room. Each desk is supplied with gas and water. Hoods for evaporation and generation of noxious gases and liquids are conveniently arranged on both sides and one end of the laboratory. From the main laboratory, easy access is had to the balance room and private laboratory of the instructor on one side and to the organic analysis and assistant's room and store room on the other. A room entirely detached from the main laboratory is fitted up for water analysis and for the polariscopic determination of sugar. The lecture room is capable of seating one hundred and fifty students. In connection with it is a preparation room, which is supplied with the necessary apparatus and specimens for illustrating the lectures.

13. GENERAL AGRICULTURAL CHEMISTRY. Five credit hours. Three terms. Prerequisite, Chemistry, 7, 12, and 42. *Tu., Th., at 9.* Laboratory, *M., Th., 1 to 4.* Professor VIVIAN, MR. DAVIS.

Two lectures and three laboratory periods weekly. Lectures on chemistry as applied to agriculture, including the following topics: Food requirements of plants, sources of plant food, soil exhaustion and amelioration, barnyard manures and commercial fertilizers, composition of feeding stuffs and dairy products. Laboratory work consists of a brief introduction to quantitative analysis, gravimetric and volumetric, followed by the analysis of fertilizers, feeding stuffs, and dairy products.

14. DOMESTIC SCIENCE CHEMISTRY. Five credit hours. Course in Domestic Science, first and second term. Prerequisite Chemistry, 7, 12, and 42. *M., F., at 9. Laboratory, Tu., F., 1 to 4, or Tu., 1 to 4, S., 8 to 11.* Professor VIVIAN, MR. DAVIS.

Lectures on household chemistry. Laboratory work consists of a brief introduction to quantitative analysis, followed by the analysis of foods and other materials of household interest.

15. INDUSTRIES RELATED TO AGRICULTURE. Four credit hours. Three terms. Prerequisite, Course 13, or an equivalent preparation in quantitative analysis. Time to be arranged. Professor WEBER.

Lectures on the manufacture of sugar from cane, sorghum, and beets; the manufacture of starch, glucose, and dextrine; the nature and production of fruit, malt, and distilled vinegars; the manufacture of alcohol, malt liquors, and wines. Laboratory practise consists of the analysis of sugar, syrup, and sugar-producing plants; determination of cane sugar and milk sugar by means of the polariscope; the analysis of flours and starches; analysis of vinegars and spirituous and fermented liquors.

16. APPLICATION OF CHEMISTRY TO AGRICULTURE. Four credit hours. *M., Tu., Th., F., at 8.* Short Courses in Agriculture and Horticulture, third term. Professor VIVIAN.

Lectures and recitations embrace the following topics: Ingredients of plants, organic and inorganic, essential and non-essential; sources of plant food, air and soil; nature of soil, mechanical portion, nutritive portion, assimilable and reserve plant food; soil exhaustion and amelioration; barnyard manure, its sources, composition, and preservation, commercial fertilizers, their rational use and methods of determining the needs of soils.

17. ADVANCED AGRICULTURAL ANALYSIS. Five credit hours. Three terms. Prerequisite, Course 13. Professors WEBER and VIVIAN.

The work of this course consists of a detailed study of the official methods of determining nitrogen, potash, phosphoric acid; the complete analysis of grains and feeding stuffs, milk, butter, and cheese. Intended for students desiring to specialize in agricultural chemistry.

18. FOOD INSPECTION AND ANALYSIS. Three to five credit hours. Three terms. Prerequisite, Course 13, or an equivalent preparation in quantitative analysis. Professors WEBER and VIVIAN.

Lectures on composition of foods and food adulteration. Laboratory practise embraces the analysis of foods, tea, coffee, syrups,

spices, condiments, flavoring extracts, baking powder; sanitary analysis of water; analysis of fats and oils, etc., and the examination of the same for adulteration. This course is designed to prepare for the analytical work connected with the state control of the sale of food stuffs, etc.

19. **DAIRY CHEMISTRY.** Three to five credit hours. Three terms. Prerequisite, Course 13. Time to be arranged. Professors VIVIAN and WEBER.

Lectures on the composition of milk and its products; fermentation, digestion, and decomposition of milk. Laboratory practise on the complete analysis of milk, butter, and cheese; determination of the chemical and physical constants of butter fat; determination of the different proteids of milk and a study of their cleavage products; effect of treatment of dairy products on their chemical composition as shown by analysis, etc. Intended for students specializing in dairying and should be accompanied or preceded by a course in dairying.

20. **CHEMISTRY OF SOILS.** Three to five credit hours. Three terms. For students specializing in Agronomy. Prerequisite, Course 13. Time to be arranged. Professors WEBER and VIVIAN.

Lectures and laboratory work on the chemical composition of the soil, using the official method of analysis of soils, and the various methods suggested by the U. S. Department of Agriculture; testing needs of soils for application of commercial fertilizers.

21. **ADVANCED HOUSEHOLD CHEMISTRY.** Three to five credit hours. Three terms. Prerequisite, Course 14. Time to be arranged. Professors WEBER and VIVIAN.

A study of the composition and analysis of foods; the chemistry of cookery and changes during cooking, as shown by analysis; the examination of cleaning materials, baking powders, the sanitary analysis of water, etc.

22. **RESEARCH WORK.** Five to ten credit hours. Three terms. Time to be arranged. Professors WEBER and VIVIAN.

23. **CHEMISTRY OF ANIMAL NUTRITION.** Three to five credit hours. Three terms. Prerequisite, Course 13 or equivalent. Time to be arranged. Professor VIVIAN.

For students specializing in Animal Husbandry.

(Courses 17 to 23 may be taken as graduate work if not previously elected, or continued as special lines of research during a graduate course. Major graduate work may be taken along these or other lines included in Agricultural Chemistry.)

AGRONOMY

(Townshend Hall)

PROFESSOR MCCALL, ASSOCIATE PROFESSOR SHOESMITH, MR. HYSLOP.

For the work in farm equipment and rural engineering the department is supplied with apparatus for studying the effect of grade, height of obstruction, height of hitch, size of wheel and weight of load on the draft of wagons. Correct and incorrect methods of constructing and using the double-tree are studied by means of a large, adjustable model. The draft of vehicles and farm implements is studied by means of a self-registering dynamometer. The agricultural machinery room contains many of the latest models of farm machinery, including binders, mowers, plows, cultivators, and gasoline engines. Several drainage levels and an architect's level are provided for the student's use in running levels and laying out drainage systems. A plane table is used for mapping and laying out fields. A small cement laboratory provides facilities for studying the use of cement and concrete on the farm. A large glass house with its equipment of railroad tracks, trucks, and pots affords opportunity for the study of the adaptability of crops to soils, the fertilizer requirements of different soils and various other problems of crop production. The soils laboratory is provided with apparatus for the study of the physical properties of soils, including specific gravity, the retention of moisture, the effect of mulches on evaporation, the rate of percolation of water through soils, and the capillary rise of moisture in soils. The laboratory is also provided with a complete centrifugal outfit for the mechanical analysis of soils, and electrical instruments for determining temperature and soluble salt content.

In the study of crops, use is made of the collection of dried specimens of grasses, grains, and seeds and the growing crops on the farm. The grass garden contains about fifty varieties of grasses and forage crops growing side by side so

that a comparative study may be made as to the value of each for pasture, meadow, or hay. A corn-breeding plot gives opportunity for the study of methods of selection and breeding of seed corn.

2. FARM EQUIPMENT. Four credit hours. First term. Prerequisite, Eng. Drawing 10. *M., W., F., at 9; W., 1 to 4.* Professor McCALL.

Lectures and recitations on the laying out, and equipment of the farm, the planning of farm buildings, and a general study of farm power, water supply, and farm machinery. Practicum in the laying out of farms, the planning of farm buildings, comparison of farm machines and in the working out of problems in draft and other farm mechanics.

4. RURAL ENGINEERING. Five credit hours. Third term. Prerequisite, Agronomy 2. *Tu., Th., at 9; M., Tu., 1 to 4.* Professor McCALL.

Lectures, recitations, and practicum on (a) location of farm buildings, and works, the survey and measurement of fields and lots; (2) planning and construction of farm buildings and works, including a study of timber, brick, cement, and other building materials; (c) the laying out and construction of drainage and irrigation systems.

11. ELEMENTARY SOILS. Four credit hours. Second term. Two-year Course in Agriculture. *M., W., F., at 9; W., 1 to 4.* Professor McCALL.

Lectures and recitations on the formation and physical properties of our agricultural soils with special reference to methods of management and improvement. Practicum in the laboratory for the study of the relation of soils to air, heat, moisture, and fertilizers.

12. ELEMENTARY SOILS. Four credit hours. Four-year courses in Agriculture and Horticulture and Forestry, third term. *M., W., F., at 8; W., or F., 1 to 4.* Professor McCALL.

Lectures and recitations on the origin, formation and kinds of soils, their chemical and physical composition, and improvement by cultivation, fertilization, drainage, and irrigation. Laboratory studies of the physical properties of soils, the factors which control soil fertility and the method of making mechanical analyses.

14. ADVANCED SOILS. Five credit hours. First term. Prerequisite, Agronomy 11 or 12. *Tu., Th., at 9; M., Tu., 1 to 4.* Professor McCALL.

Lectures and recitations upon the kinds and distribution of soils in the United States, the factors underlying their fertility, and their crop-producing power as affected by methods of cultivation and cropping. Special laboratory work will be assigned to each student.

16. FIELD WORK IN SOILS. Three credit hours. First term. Lecture arranged. *S.*, 8 to 12. Professor McCALL.

Lectures on the general character of the more important soils of the United States, methods of establishing soil types, and the adaptability of special crops to these different soil types. Practical work in the mapping of soils in the field, the identification of the soil types, and the preparation of reports.

22. FIELD CROP PRODUCTION. Four credit hours. Third term. Prerequisite, Botany 1, or its equivalent. *M.*, *W.*, *F.*, at 9; *W.*, 1 to 4. Associate Professor SHOESMITH.

A brief study of the history, classification, cultivation, harvesting, and marketing of field crops, with special reference to Ohio conditions.

23. SEED AND MARKET GRAIN. First term. Two credit hours. Time to be arranged. Practicum. Prerequisite, Agronomy 22. Associate Professor SHOESMITH.

Seed selection, corn, and small grain judging, and the market grading of grains.

27. GRASSES AND FORAGE CROPS. Three credit hours. First term. Prerequisite, Botany 1 or its equivalent. *M.*, *W.*, at 9, *W.*, 1 to 4. Associate Professor SHOESMITH.

A study of the characteristics and habits of growth of the principal grass and forage crops of the United States, with special reference to their adaptability to soil and climatic conditions. The silo and silage crops. Laboratory work in seed testing, both for purity and germination.

24. AGRICULTURAL EXPERIMENTATION. Four credit hours. Second term. Lecture arranged. *M.*, *Tu.*, 1 to 4. Professor McCALL.

Lectures upon history and development of experiment stations, methods, and character of station work, and the interpretation of experimental results. Seminars devoted to the study of experiment station literature, and to the methods of experimentation.

26. FIELD CROP IMPROVEMENT. Three credit hours. Third term. Prerequisite, Agronomy 22. *Tu.*, *Th.*, at 10; *W.*, 1 to 4. Associate Professor SHOESMITH.

A study of the principles involved and the methods used in the

improvement of field crops. The value of selection, cross fertilization, and imbreeding of plants.

GRADUATE WORK

Special work in Soils, or Crops, may be arranged for students desiring to take a graduate course along these lines.

AMERICAN HISTORY AND POLITICAL SCIENCE

(University Hall, Rooms 205 and 410.)

PROFESSOR KNIGHT, PROFESSOR SPENCER, MR. DYKSTRA

AMERICAN HISTORY

1. **POLITICAL HISTORY OF THE UNITED STATES.** Three credit hours. Three terms. Thwaite's *The Colonies*; Hart's *Formation of the Union*; Wilson's *Division and Re-union*. *M., W., F., 8 or 9.* Professor KNIGHT, Professor SPENCER, Mr. DYKSTRA.

A general course in the political history from the earliest colonial times to the present. Text-books, prescribed readings, and topical reports.

ANATOMY AND PHYSIOLOGY

(Biological Hall, Rooms 12 and 20.)

PROFESSOR BLEILE, DR. SEYMOUR, DR. BEER

The facilities provided for the study of Anatomy, Histology, and Physiology are good. The laboratory is supplied with skeletons, manikin, and many models of the organs of the body. The apparatus for work in physiology is of good construction and adequate for the performance of fundamental physiological experiments.

For work in Histology the equipment includes fifty individual tables for student work, each one being supplied with a good microscope and the various accessories. The equipment of the laboratories makes it possible to offer work along certain lines to advanced students.

1. **HUMAN ANATOMY AND PHYSIOLOGY.** Three credit hours. Three terms. Lectures, recitations and laboratory work. This course must be preceded or accompanied by a course in chemistry. *Sec. I, M., W., F., at 8.* Dr. SEYMOUR. *Sec. II, M., Th., F., at 10.* Professor BLEILE.

2. GENERAL PHYSIOLOGY. Three credit hours. First term. Short course in Agriculture. Lectures, recitations, and demonstrations. *M., W., F., at 9.* Dr. BEER.

3. CHEMICAL PHYSIOLOGY. Three credit hours. Course in Domestic Science, third term. *Th., F., 1 to 4.* Professor BLEILE.

ANIMAL HUSBANDRY

(Townshend Hall.)

PROFESSOR PLUMB, PROFESSOR MARSHALL, MR. WILLIAMS

Various methods are made use of in educational work in Animal Husbandry. The University herd contains a large number of very high class, valuable animals. These include excellent specimens for class room work of pure bred Short-horn, Aberdeen Angus, Galloway, Jersey, Guernsey, Holstein-Friesian, and Red Polled cattle, and a variety of grade and pure bred beef steers. Good specimens of Merino, Southdown, Shropshire, and Cotswold sheep and Berkshire, Poland China, Hampshire, and Large Yorkshire swine are also kept. The University owns some choice pure bred Percheron, Clydesdale, and Hackney mares, as well as several excellent grade French Coach horses. In addition to this, at convenient distances are famous studs of imported Percheron, French Coach, German Coach, and Belgian horses. Students are conducted to Columbus stables containing large number of horses, and to stock farms about Columbus and in neighboring counties, where methods of feeding and handling may be studied and animals inspected. Each year a class of students attends the International Live Stock Exposition at Chicago in charge of instructors, spending a few days among the stock exhibits, the Union stock yards, and packing houses. Class room facilities in animal husbandry are of a very high order. The judging pavilion for live stock is a beautiful brick structure with a large room 112 feet long, with tan bark floor, on which stock may be shown to the very best advantage. This building, with the new cattle and horse barns, all constructed in 1907

at a cost of \$80,000, gives the University the very finest of facilities for teaching Animal Husbandry. As additional facilities for instruction, the University has a very superior collection of herd, flock, and stud books of the various American and European breeding associations, these being used in laboratory work in the Principles of Breeding. There is also a large collection of lantern slides of breeds and types of animals, various instruments for measuring and studying stock, specimens of feeding stuffs, wools, and other animal products.

FOUR-YEAR COURSE

2. TYPES AND BREEDS OF LIVE STOCK. Four credit hours. First term. *M., Tu., Th., at 10; M., 1 to 4.* Professor PLUMB, Professor MARSHALL.

Lectures, text-book, and recitations, upon the history, development, characteristics, and adaptations of types and breeds of horses and sheep. Laboratory work includes judging types and breeds of horses and sheep one afternoon a week and occasional inspection trips to herds in the state.

4. TYPES AND BREEDS OF LIVE STOCK. Four credit hours. Third term. *M., Tu., Th., at 10; M., 1 to 4.* Professor PLUMB, Professor MARSHALL.

Covers the subjects of Cattle and Swine on the same basis as Animal Husbandry.

6. PRINCIPLES OF BREEDING. Four credit hours. Second term. *M., W., F., at 9; W., 1 to 4.* Professor MARSHALL.

Lectures, text-book, and recitations upon the subjects of heredity from various points of view in its application to breeding farm animals. Library research is required, and for laboratory work one afternoon a week is devoted to studying pedigree construction, and working out problems in heredity from the herd books.

8. FEEDING ANIMALS. Four credit hours. Second term. *M., Tu., Th., F., at 10.* Professor PLUMB.

A consideration of the laws of nutrition, the character and composition of feed stuffs and methods of feeding different kinds of farm animals under varying conditions. Work to a reasonable extent is required of students in calculating rations and in studying rations in practical use in the community and suggesting improvements if desirable. The economy of the subject is carefully considered.

10. **HYGIENE AND MANAGEMENT.** Four credit hours. Second term. *M., Tu., Th., F., at 8.* Professor MARSHALL.

A series of lectures on the sanitation of the stable, on conditions of health surrounding stock in general, and a discussion of the approved methods to be used in managing and caring for horses, cattle, sheep, and swine.

12. **ANIMAL CONFORMATION AND STOCK JUDGING.** Four credit hours. First term. *F., at 8; Th., F., 1 to 4.* Professor PLUMB, Professor MARSHALL.

This is an advanced class for students who have already had the work of the Junior year in Courses 2 and 4. The purpose is to give a more detailed consideration to type and breed conformation, with an emphasis on practise in judging groups and classes and rendering required reasons therefor.

14. **LIVE STOCK MARKETING AND COMMERCE.** Four credit hours. Third term. *M., W., F., at 8; F., 1 to 4.* Professor PLUMB.

A discussion of the purposes and work of live stock markets, methods of sale and shipment, the practises of the live stock markets and yards, the market classifications and grading, the export and import trade, etc. Considerable library work is required in this subject, studying comparative market reports and market development. Visits are also made to stock yards, transportation agencies, packing houses, etc.

16. **WOOLS AND OTHER ANIMAL FIBERS.** Four credit hours. Second term. Time to be arranged. Professor PLUMB.

Lectures and recitations upon the sources of wool supply and other animal fibers; character, composition and classification of wools and fibers; preparation, shipping, methods of shearing, uses of wools, etc. Laboratory work includes instruction in shearing, classifying wools, studying fibers, etc.

19. **HIPPOLOGY.** Two credit hours. First term. *Tu., Th., at 11.* Professor MARSHALL.

A study of equine intelligence and the training and development of the horse to the purposes of man. This also includes the study of methods of riding and driving, etc.

20. **MEATS AND MEAT PRODUCTS.** Two credit hours. Second term. *Tu., Th., at 11.* Professor PLUMB.

Methods of slaughter of farm animals, the preparation of the carcass and the various products derived therefrom.

21. **THE HARNESS AND VEHICLE.** Two credit hours. Third term. *Tu., Th., at 11.* Professor MARSHALL.

A study of the harness and vehicle, their history and development, construction, and adaptability to various uses in connection with the horse.

22. BIOGRAPHICAL STUDIES OF MASTER BREEDERS. One credit hour. Third term. Time to be arranged. Professor PLUMB.

A series of lectures discussing the lives and methods of famous master breeders of live stock.

23. TYPES AND CLASSES OF CATTLE AND SHEEP. Four credit hours. First term. *M., W., F., at 11; W., 1 to 4.* Mr. WILLIAMS.

A discussion of the various types of cattle and sheep and the market classes. Judging work will include specimens of the various types and classes judged by score card, comparison, etc.

24. TYPES AND CLASSES OF HORSES AND SWINE. Four credit hours. Second term. *M., W., F., at 11; W., 1 to 4.* Professor MARSHALL, Mr. WILLIAMS.

A discussion of the various types and classes and grades of horses and swine. Judging work will include score card and comparative studying of individuals and groups.

26. DAIRY CATTLE. Four credit hours. Third term. *M., W., F., at 11; W., 1 to 4.* Professor PLUMB, Mr. WILLIAMS.

The different breeds of dairy cattle will be studied, a limited amount of score card work conducted, and considerable judging by comparison in group method. Dairy herds in the vicinity of Columbus will also be visited.

TWO-YEAR COURSE

1. TYPES AND BREEDS OF LIVE STOCK. Four credit hours. Three terms. *M., W., F., at 9; Tu., 8 to 11, or 1 to 4.* Professor PLUMB, Professor MARSHALL.

Text-book and discussion on the history, characteristics, adaptability, economic value, etc., of types and breeds of live stock. Practical work in judging one afternoon a week, both score card and comparative group work being used.

3. FEEDING ANIMALS. Three credit hours. Second term. *M., W., F., at 11.* Mr. WILLIAMS.

A study of the principles of nutrition, character, and composition of feed stuffs and methods of feeding different kinds of farm animals under various conditions.

5. PRINCIPLES OF BREEDING. Four credit hours. Third term. *M., W., F., at 11.* Laboratory to be arranged. Professor MARSHALL.

Text-book, lectures, and recitations upon the subject of heredity in its applications to the breeding of farm animals. Library research is required and for laboratory work a study of pedigrees, problems in heredity, etc., as worked out from the herd books.

25. DAIRY CATTLE. Four credit hours. First term. *M., W., F., at 11.* Laboratory to be arranged. Professor PLUMB, Mr. WILLIAMS.

Text-book and discussion of the history, characteristics, economic value, etc., of breeds of dairy cattle. Practical work in judging one afternoon a week, various methods being used. Herds of cattle in the vicinity will be visited.

GRADUATE WORK IN ANIMAL HUSBANDRY will be provided in this department to suit the needs of the student, under the general rules of the University for this work. Special facilities, however, will be furnished in any one of the following, selected as a major subject, in connection with a minor study pursued in another department: (a) Breed, history, and development; (b) animal nutrition; (c) heredity in its application to the horse; (d) the education and training of the horse; (e) wool and its uses; (f) live stock registration; (g) live stock markets; (h) live stock judging.

These are offered as lines of special study under departmental direction. Special investigational facilities are at hand, in the use of the University stables, the laboratory in agricultural chemistry, the extensive library of works on animal husbandry, the large stables in and about Columbus, etc. No animal husbandry department in America has at its disposal a more comprehensive supply of material for the student of the horse.

ARCHITECTURE

(Brown Hall.)

PROFESSOR BRADFORD

9. HISTORY OF ARCHITECTURE. Three credit hours. First term. Lectures illustrated by lantern slides. *M., W., F., at 11.* Professor BRADFORD.

10. Continuation of 9. Three credit hours. Second term. *M., W., F., at 11.* Professor BRADFORD.

11. Continuation of 10. Three credit hours. Third term. *M., W., F., at 11.* Professor BRADFORD.

ART

(Hayes Hall)

PROFESSOR BRACKEN, ASSISTANT PROFESSOR LAVER

10. DESIGN AND COMPOSITION. Two credit hours. First term. *Th.*, or *F.*, 1 to 4.

A course designed to develop appreciation of harmony of line, space, and color. Brings into play the creative imagination and establishes a basis for critical judgment along all art lines. Representative study of flowers, grasses, foliage, trees, and landscape for lines of growth and color. Space relation, original designs with straight and curved lines. Nature motives used in design and composition. Study of color theory and harmony. Design for book covers, posters, etc. Charcoal, pencil, ink, and water color are mediums used.

11. Continuation of 10. Two credit hours. Second term. *Th.*, or *F.*, 1 to 4.

Study of form in common and beautiful objects. Relation of design to construction and use of object and adaptation of suitable ornament. Composition with still life forms. Study of action and proportion as found in the human figure and other animals. Application of same to design. Study of historic ornament. Designs for textiles and rugs. Study of dark and light in design. Application of color schemes.

12. Continuation of 11. Two credit hours. Third term. *Th.*, or *F.*, 1 to 4.

Landscape. Spring flowers and foliage. Conventionalization of nature forms for use in design. Landscape composition. Designs for interiors.

ASTRONOMY

(Townshend Hall.)

MR. J. WARREN SMITH

3. METEOROLOGY. Two credit hours. Second term. Text-book, Waldo. Time to be arranged.

Lectures on practical meteorology and climatology, supplemented by laboratory work in map making. The daily weather maps are discussed and used as a basis for the practical side of the work. Instruction is given in handling the principal meteorological instruments.

BACTERIOLOGY

(Office, Veterinary Laboratory Building.)

PROFESSOR MORREY, MR. M'CAMPBELL, MR. GROSVENOR

These courses in Bacteriology are open to advanced undergraduate and graduate students only. The instructor in charge must be consulted before electing.

5. GENERAL BACTERIOLOGY. Three to five credit hours. First term. Lecture, *Tu.*, at 9, or *M.*, at 11; quiz, *Th.*, at 9, or *F.*, at 11; laboratory, *Tu.*, *Th.*, 1 to 4, or *W.*, *F.*, 1 to 4. Professor MORREY, Mr. McCAMPBELL, Mr. GROSVENOR.

7. PATHOGENIC BACTERIOLOGY. Three to five credit hours. Second and third terms. Lecture, *M.*, at 11; quiz, *F.*, at 11; laboratory, *W.*, *F.*, 1 to 4. Prerequisite, Course 15. Professor MORREY, Mr. McCAMPBELL.

8. DAIRY BACTERIOLOGY. Three to five credit hours. Second and third terms. Lecture, *M.*, at 10; quiz, *F.*, at 10; laboratory, *Tu.*, *Th.*, 1 to 4. Prerequisite, Course 5. Professor MORREY.

9. SOIL BACTERIOLOGY. Three to five credit hours. Second and third terms. Lecture, *Tu.*, at 10; quiz, *Th.*, at 10; laboratory, *Tu.*, *Th.*, 1 to 4. Prerequisite, Course 5. Professor MORREY.

13. ADVANCED DAIRY BACTERIOLOGY. Three to five credit hours. Three terms. Prerequisites, Courses 5 and 8, or equivalents. Professor MORREY.

14. ADVANCED SOIL BACTERIOLOGY. Three to five credit hours. Three terms. Prerequisites, Courses 5 and 9, or equivalents. Professor MORREY.

2. AGRICULTURAL BACTERIOLOGY. Three credit hours. Second term. For two years courses in Agriculture and Horticulture.

BOTANY

(Botanical Hall.)

PROFESSOR KELLERMAN, ASSOCIATE PROFESSOR SCHAFFNER, ASSISTANT PROFESSOR GRIGGS, MISS DETMERS

The department offers good facilities for instruction and investigation. A large number of charts, many of them lithographs, photographs, and mounted illustrative specimens, are among the appliances for daily class work. The museum contains a large amount of illustrative material; the native medicinal plants and the collection of Ohio woods

being very complete. The State herbarium consists of between fifteen and twenty thousand sheets of Ohio plants. The large laboratory is well equipped with dissecting and compound microscopes, also the usual appliances for doing both elementary and advanced histological work. The green house attached to the Botanical building is an important adjunct to the department, furnishing much fresh material for laboratory use. It is also used as a laboratory to carry on special work when growing plants are used.

1. ELEMENTARY BOTANY. Five credit hours. Third term. Text-books, Coulter's Botany and Kellerman's Spring Flora (New edition). *M.*, *Tu.*, *W.*, *F.*, at 8.

This is a general course introductory to those that follow. It comprises mostly organography and vegetable physiology and a study of the native flora, but some instruction is also given in ecology and classification. For the practical or laboratory work, Kellerman's Practical Exercises is used as a guide. The students are required to do some work in the field in both observation and collecting.

6. GENERAL BOTANY. Four credit hours. First term. Text-book, Barnes' Plant Life. *Tu.*, *Th.*, at 11; *Tu.*, *F.*, 1 to 3.

This is intended to be a complete course showing the evolution of plants from the lowest to the highest. Ecology and physiology are the more prominent subjects, but some instruction is given in morphology and classification. The laboratory work includes a general course in histology, with practise in experimental physiology. The student receives instruction and practise in handling the microscope, and has the opportunity of learning much of the important methods in technique.

7. ECONOMIC BOTANY. Four credit hours. Second term. *Tu.*, *Th.*, at 11; *Tu.*, *F.*, 1 to 3.

This course is, in part, a continuation of Course 6, and the same text-book is used, but the major part of the term is devoted to a botanical study of economic plants and the vegetable products of commerce. The laboratory work includes the microscopic study of fibers, starches, resins, gums, and many other important vegetable products.

8. VEGETABLE PATHOLOGY. Four credit hours. Third term. *Tu.*, *Th.*, at 11; *Tu.*, *F.*, 1 to 3.

The diseases of plants due to inorganic causes are briefly studied, but the main part of the course is devoted to a study of the parasitic fungi most destructive to cultivated plants. The means of their prevention forms the last part of the course. The laboratory and field work deals mainly with the commonest and most injurious parasitic fungi. Each student takes some economic subject or group of parasites for special study during the latter part of the term; he is also required to devote two hours each week to the execution of an experiment in plant pathology, and prepare a complete report on the same.

13. **PHYSIOLOGICAL, ECONOMIC, AND HOUSEHOLD BOTANY.** Three terms. Three credit hours. *W.*, at 11; *M., W.*, 1 to 3.

This is intended for students who desire a general course in which the practical and economic aspects of botany are emphasized; for those who expect to teach in the secondary schools, and for students of domestic science. A brief survey of the plant groups, the physiology of plants with some experimental work, the important vegetable products of commerce, the culinary, medicinal, oil, starch, and fiber producing plants, a microscopic study of the tissues, of starches, fibers, etc.; also yeasts, fermentation, food-destroying fungi, identification of edible and poisonous mushrooms, form the main topics of the course. In the latter part of the year training in an independent experiment is given each student. Lectures and recitations one hour weekly; two laboratory periods devoted to microscopic work, experiments, and field work.

17. **FOREST BOTANY.** Four credit hours. Three terms. Pre-requisite, Botany 6, 7, and 8, or 21, 22, and 23. *Tu., Th.*, at 3; laboratory and field work and seminars, *Tu., Th.*, 1 to 3.

It includes a study of native and introduced trees and the preparation of a dendrological herbarium; attention is given to the determination of trees by means of leaf and twig characters. This is followed by a study of the development of woods, characters of coniferous, hard, and soft woods and changes due to attacks of fungi. The students are required to prepare a series of gross and microscopic sections. In the spring term a study is made of the genetic development of local forests, as well as other ecologic conditions, and a general consideration of fungi injurious to trees and wood. Students are required to prepare a pathological herbarium.

9. **DENDROLOGY.** Two credit hours. Three terms. *M., W.*, 10 to 12.

Lectures, laboratory and field work. Kellerman's *Forest Trees of Ohio* and various reference books are used. The native trees are

studied and illustrative collections made in the fall term. In the winter and spring terms, laboratory work and special investigations on the development and character of wood and the structure and diseases of timber, and other selected topics are taken up.

11. LABORATORY WORK IN ECONOMIC BOTANY. Two to five credit hours. Three terms. Laboratory open daily, 8 to 12.

Special investigations in economic botany, including vegetable pathology.

CHEMISTRY

(Chemical Hall.)

PROFESSOR M'PHERSON, ASSISTANT PROFESSOR EVANS, MR. VOGT, MR. MORRIS, MR. LUCAS, AND DEPARTMENT FELLOWS

The laboratories of the department accommodate over one thousand students. Each laboratory is equipped with all the necessary conveniences—water, gas, electric lights, distilled water piped from a large still in the attic, steam ovens, automatic air blasts, suction pumps, etc. The department is liberally supplied with the best apparatus and materials for both lecture room and laboratory work. Each student has his own desk, with drawers and locker. All supplies are procured from the chemical store room, which has always on hand a complete stock of all necessary materials.

7. ELEMENTARY CHEMISTRY. Four credit hours. First and second terms. Lecture, *M.*, at 8 or 3; quiz, *F.*, at 8, 10, 11, 1, or 3; laboratory, *M.*, *Tu.*, 1 to 4, or *Th.*, *F.*, 1 to 4, or *W.*, 8 to 10; *S.*, 8 to 12. Assistant Professor EVANS, MR. VOGT, MR. MORRIS, and department fellows.

During the first term, the work is confined to a study of the non-metals and the general laws of chemistry. The metals are studied during the second term. The laboratory work bears directly on the subject under discussion in the class room.

44. GENERAL CHEMISTRY. Four credit hours. First and second terms. Lecture, *W.*, at 9; quiz, *F.*, 8, 9, or 3; laboratory, *M.*, *Tu.*, 1 to 4; *Th.*, *F.*, 1 to 4. Professor McPHERSON, Assistant Professor EVANS, MR. VOGT, MR. MORRIS, and department fellows.

Lecture, quiz, and laboratory work. This course is arranged for students who present chemistry as an entrance requirement.

3. ELEMENTARY CHEMISTRY. Four credit hours. Short courses. First and second terms. Lecture, *M.*, at 10; quiz, *Th.*, at 8; labora-

tory, *M.*, *Tu.*, 1 to 4, or *Th.*, *F.*, 1 to 4. Assistant Professors EVANS, WITHROW, MR. VOGT, MR. MORRIS, and department fellows.

12. QUALITATIVE ANALYSIS. Four credit hours. Third term. One lecture, one quiz, and six hours' laboratory work. For time, see 7 or 44. Assistant Professors EVANS, WITHROW, MR. VOGT, MR. MORRIS, and department fellows.

After working through the preliminary tests for the acids and metals, each student is required to work out a number of unknown substances.

45. QUALITATIVE ANALYSIS. Four credit hours. One lecture, one quiz, and six hours' laboratory work. Short courses, third term. For time, see 3. Assistant Professors EVANS, WITHROW, MR. VOGT, MR. MORRIS, and department fellows.

42. ELEMENTARY ORGANIC CHEMISTRY. Two credit hours. Third term. *M.*, *F.*, at 9. Assistant Professor EVANS.

This course consists in a study of a few of the more important classes of organic compounds, preparatory to the work in Agricultural Chemistry.

46. ORGANIC CHEMISTRY. Two credit hours. First, second, and third terms. Two lectures weekly. *Tu.*, *Th.*, at 8. Prerequisite, Courses 20, and 21, except by special permission of the instructor. Professor MCPHERSON.

47. ORGANIC CHEMISTRY. Two or three credit hours. First, second, and third terms. Six or nine hours laboratory work weekly. Laboratory open afternoons. Professor MCPHERSON.

DAIRYING.

(Townshend Hall)

PROFESSOR ERF, MR. GUTHRIE, MR. NYSTROM

The dairy laboratories permit of work along the following lines: milk testing, buttermaking, cheesemaking, the care and bottling of sanitary milk, and dairy mechanics.

Individual milk testing apparatus is furnished, and in the laboratory are found the necessary Babcock testers, balances, etc. The creamery laboratory is equipped with various styles of cream separators, cream ripeners, starters, cans, and churns. The cheese laboratory is well equipped and has a cold curing room and a cellar for curing brick and

Swiss cheese. Butter is made throughout the year on a creamery basis from the milk and cream from a number of dairies aggregating over one hundred cows. The sanitary milk room is a model, containing a complete "Star" outfit, which includes a steam pressure sterilizing chest. A fine refrigerator is provided for the bottled milk, and the whole is placed on a practical basis of operation, the milk from the University herd being standardized on a fat basis, bottled and sold, students doing the work.

The dairy mechanics' work is provided for in a powerhouse with equipment of boiler, engine, mechanical refrigerating plant, pumps, pipe fitting apparatus, and soldering outfits.

It is intended that the laboratory work shall be of the most practical kind and is supplemented by lectures, recitations, and quizzes in the class room.

The work of the department is designed for three classes of students, namely, the regular students in the two and four-year courses, and a special winter class of dairymen, who come for the special dairy course designed to train dairymen who cannot devote a longer time to scientific dairy methods, and to dairy farmers.

12. PRINCIPLES OF DAIRYING. First term. Four credit hours. *Tu., Th., 1 to 2. Laboratory, Tu., Th., 2 to 4. Professor ERF.*

Lectures on secretion and testing of milk and cream for butter-fat; feeding and caring for dairy cows as related to the economical production of milk; formation of profitable herds; testing individual cows and herds for butter-fat production, and also how to enter and test cows for the advanced registries. In the laboratory, practical work will be given in testing milk and cream for butter-fat; testing dairy herds for butter-fat production; and practise in operating farm cream separators.

14. BUTTERMAKING. Five credit hours. Third term. Pre-requisite, Dairying 12. Time to be arranged. MR. GUTHRIE.

In the lecture room, the principles of making butter, including cream separation, pure cultures, churning, packing and marketing butter, will be thoroughly discussed. In the laboratory, the work discussed in the lecture room will be put into practise.

16. CHEESE AND FANCY DAIRY PRODUCTS. Five credit hours. Second term. Time to be arranged. MR. GUTHRIE.

While cheesemaking is the basis of this course, and demonstrations will be given in the manufacture of Cheddar, Swiss, and brick cheese, the subject will be treated from the standpoint of the farmer who sells his milk to the factory rather than that of the cheesemaker. Fancy products, such as cottage, Neufchatel, and soft cream cheese, junkets, ice cream, etc., will be considered.

22. DAIRY MECHANICS. Three credit hours. First term. MR. NYSTROM.

This work will consist of one lecture and two three-hour laboratory periods. It will treat of the construction and operation of the steam boiler and engine, steam pumps, belting, hanging of shafting and pulleys, pipe fitting and soldering. It is intended to train the students to do the mechanical work in a farm dairy, cheese factory, and creamery.

23. ADVANCED DAIRYING. Three credit hours. Second and third terms. Professor ERF.

Work in dairy mechanics or buttermaking may be continued or a seminar on assigned readings in experiment station and other dairy literature will be arranged, and laboratory work suggested by the line of reading may be pursued. The purpose of the course is to enable the student, who wishes to specialize in dairying, to follow with wide latitude the various lines of dairy work.

20. HOUSEHOLD DAIRYING. Two credit hours. Third term. Time to be arranged. Professor ERF.

The composition of milk and its products, and the production of sanitary and modified milk will be considered. In the laboratory, demonstrations in testing milk and butter for purity, making of butter, cheese, junkets, and ice cream will be given.

24. DAIRY EQUIPMENT. Four credit hours. Second term. *Tu., Th., at 1.* Laboratory, *Tu., Th., 2 to 4.* Professor ERF.

Lectures on planning and equipping dairy barns, yards, milk houses, dairy plants, farm ice houses and refrigerators, etc.; the treatment, care, and bottling of milk and cream on the farm for city trade; testing milk for purity and adulteration, also for butter-fat and milk solids in order to have it comply with the standards laid down by law. In the laboratory practical work will be given in pipe fitting; soldering; setting up dairy machinery, etc., necessary to equip a farm dairy. Practical work will also be given in clarifying, pasteurizing, standardizing, and bottling milk and cream.

26. FARM DAIRYING. Four credit hours. Third term. *Tu., Th., 1 to 4.* Laboratory, *Tu., Th., 2 to 4.* Professor ERF.

Lectures on handling and the manufacturing of dairy products for the milk; on dairy farm management, comparing the profitability of each of the different systems of dairying under various conditions. In the laboratory, practical work will be given in the manufacture of butter, soft cheeses, ice cream, and other farm dairy products.

DOMESTIC SCIENCE

(Hayes Hall)

PROFESSOR WARDALL, ASSOCIATE PROFESSOR BABB

DOMESTIC SCIENCE

1. THE SELECTION AND PREPARATION OF FOODS. Four credit hours. First term. *Tu., Th., at 9; Th., F., 1 to 3, or Tu., 10 to 12; W., 8 to 10.* Professor WARDALL.

A study of food principles, their occurrence in food stuffs, effects of heat and fermentation, and the comparative cost of nutrients from various sources. Lecture and recitation work is combined with laboratory work and marketing expeditions. Laboratory fee, \$3.00.

2. Continuation of 1. Four credit hours. Second term. *Tu., Th., at 9; Th., F., 1 to 3, or Tu., 10 to 12; W., 8 to 10.* Professor WARDALL.

3. Continuation of 2. Four credit hours. Third term. *Tu., Th., at 9; Th., F., 1 to 3, or Tu., 10 to 12; W., 8 to 10.* Professor WARDALL.

4. DIETETICS. First term. Four credit hours. *Tu., Th., at 8; M., Tu., 1 to 3.* Prerequisite, Domestic Science, 1, 2, 3; Physiology 1, and Agricultural Chemistry 14. Professor WARDALL.

A study of the principles of diet, food in its relation to health, standard dietaries, construction of dietaries and diet in disease. The principles of home nursing and preparation of food for the sick are given at the close of the other work. Lecture, recitation, and laboratory work are combined. Laboratory fee, \$3.00.

10. THE HOUSE. Three credit hours. First term. Time to be arranged. Professor WARDALL.

Situation of the house with regard to general surroundings. The householder's interest in the construction of the house. Sani-

tary conditions in and around the house. Ventilation, water supply, heating, and plumbing. Exercises in making skeleton house plans.

11. HOUSEHOLD MANAGEMENT. Three credit hours. Second term. Prerequisite, Courses 1, 2, 3, and 4. Time to be arranged. Professor WARDALL.

The aim of this course is to set forth some of the principles underlying housekeeping, including the organization of the household, division of income, and chemistry of cleaning.

12. TEACHERS' COURSE. Three credit hours. Third term. Time to be arranged. Professor WARDALL.

This course is designed for the student who prepares to teach. A study is made of courses of study and practise given in making them. Some practise is given in presenting and criticising lesson plans.

13. SEMINARY. Two credit hours. Three terms. Open only to fourth year and graduate students. Time to be arranged. Professor WARDALL.

DOMESTIC ART

1. HAND CRAFT. Two credit hours. First term. *W.*, at 11; laboratory, *Th.*, 1 to 3, or *F.*, 1 to 3. Associate Professor BABB.

A systematic study of the principles of plain needle work. The application in various articles. A study of race development as shown in hand work and in the evolution of spinning and weaving. Lectures and recitations. Laboratory fee, \$3.00.

2. TEXTILES. Two credit hours. Second term. *W.*, at 11; laboratory work, *Th.*, 1 to 3, or *F.*, 1 to 3. Associate Professor BABB.

This course covers a study of fabrics, history, processes of manufacture and the development of these processes, economic values and their effect on social conditions. Also garment making; the taking of accurate measurements, drafting by simple measurements; the choice and economical cutting of materials, and the making of garments. Lectures, discussions, and essays. Laboratory fee, \$1.00.

3. A continuation of Course 2. Two credit hours. Third term. *W.*, at 11; laboratory, *Th.*, 1 to 3, or *F.*, 1 to 3. Associate Professor BABB.

4. HISTORY OF COSTUME. DESIGN AND DRESSMAKING. Four credit hours. Second term. Prerequisite, Courses 1, 2, and 3. *Tu.*, *Th.*, at 8; laboratory work, *M.*, *Tu.*, 1 to 3. Associate Professor BABB.

Costume designing; making of patterns from systems of dress-

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making; making waists and skirts, and tailor pressing and construction. Fall Millinery. Laboratory fee, \$1.00.

5. HOUSEHOLD ART AND DECORATION. A continuation of Course 4. Four credit hours. Third term. Prerequisite, Courses 1, 2, and 3. *Tu., Th., at 8*; laboratory, *M., Tu., 1 to 3*. Associate Professor BABB.

Art in every day life; effect of color in the home; healthful and beautiful clothing and furniture. Spring millinery, practical construction and artistic trimming of hats. Laboratory fee, \$1.00.

6. THEORY AND PRACTISE OF TEACHING DOMESTIC ART. Three credit hours. First term. Time to be arranged. Associate Professor BABB.

This course deals with the place of Domestic Art in modern education. A study of courses of work and equipment in various schools, the organization and management of departments, the planning and furnishing of class rooms and laboratories. Laboratory fee, \$1.00.

7. EMBROIDERY. One credit hour. Three terms. Prerequisite Domestic Art 1, 2, and 3. Time to be arranged. Associate Professor BABB.

This course aims to give a knowledge of the necessary stitches used in decorative art, and also the applications of these principles in the completed article. It considers the question of art in applied design, and connects its work directly with Domestic Art 4 and 5, and Art. 10, 11, and 12. The decoration of undergarments and fancy dress waists, of household articles, of collars, and cuffs, and the like, receive attention. Laboratory fee, \$1.00.

NOTE.—*In all courses except Course I, students provide their own material.*

DRAWING

(See Engineering Drawing)

ECONOMICS AND SOCIOLOGY

(University Hall. Office, Room 211)

PROFESSOR HAGERTY, ASSOCIATE PROFESSOR HAMMOND, MR. GEPHART

33. ELEMENTS OF POLITICAL ECONOMY. Three credit hours. Three terms. *M., W., F., at 9*. MR. GEPHART.

A careful study of the laws of production, exchange, distribution, and consumption of wealth; combined with an analysis of the industrial actions of men as regards land, labor, capital, money,

credit, rent, interest, wages, etc. Text-book, lectures and individual investigations.

42. PUBLIC FINANCE AND TAXATION. Two credit hours. First and second terms. Text-book, Adams' Finance. *Tu., Th., 2.* Prerequisite, 33. Associate Professor HAMMOND.

This course aims to make the student acquainted with the theory of public revenue and expenditure, and with the leading systems of financial administration throughout the world.

43. FINANCIAL HISTORY OF THE U. S. Third term. Two credit hours. *Tu., Th., at 2.* Prerequisite, Course 42. Associate Professor HAMMOND.

44. TRANSPORTATION. Two credit hours. *M., W., F., at 9.* Three terms. Prerequisite, 33. Associate Professor HAMMOND.

The public character of the transportation industry. The history of transportation. Growth of the railway system and the principal lines of communication. The relation of the railroad to other means of transportation. The organizations and management of railroads. Railway capitalization. Railway rates, pools, mergers, and consolidations. Railway commissions and public control. Government ownership of railroads. Especial attention is given to the railway problem in the United States.

ENGINEERING DRAWING.

(Brown Hall, Rooms 42, 46)

PROFESSOR FRENCH, ASSISTANT PROFESSOR LEWIS, MR. TIDBALL, MR. MEIKLEJOHN, MR. ROGERS, MR. NORRIS

10. MECHANICAL DRAWING. Three credit hours. First term. *M., Tu., 1 to 4; Th., F., 1 to 4; Tu., Th., 9-12.* Professor FRENCH, Mr. MEIKLEJOHN.

Lectures and practise. Elementary mechanical drawing, lettering and working drawings.

20. MECHANICAL DRAWING. One credit hour. First term. *Th., 1 to 4.* Professor FRENCH.

Lectures and practise. Elementary mechanical drawing and lettering.

14. PEN DRAWING. Two credit hours. First term. Prerequisite, Course 28. Time to be arranged. MR. NORRIS.

15. HOUSE PLANNING. One and one-half credit hours. Second and third terms. *Th., 1 to 4.* Prerequisite, Course 20. Professor FRENCH.

40. CLAY MODELING. Two credit hours. Second term. Prerequisite, Drawing 27. *M., Tu., 3 to 5.* Assistant Professor LEWIS.

Modeling in clay, ornamental forms from plaster casts, photographs, and nature.

41. CLAY MODELING. Two credit hours. Third term. Prerequisite, Drawing 40. *M., Tu., 3 to 5.* Assistant Professor LEWIS.

Modeling in clay and wax from photographs, nature, and original designs. Casts made in plaster and gelatine moulds.

ENGLISH

(University Hall, Rooms 117 to 120)

PROFESSOR DENNEY, BARROWS,* ASSOCIATE PROFESSOR TAYLOR, ASSISTANT PROFESSORS GRAVES, MCKNIGHT, DUNCAN, MR. MCKINNEY, MR.

BLANCHARD, MR. PARKER, MR. PENNOCK, MISS

HUTSINPILLAR

1. PARAGRAPH WRITING AND ANALYSIS OF PROSE. Two credit hours. Three terms. Text-book, Scott and Denney's Paragraph Writing. *Tu., Th., or W., F., at 8; Tu., Th., at 9, 10, or 11.* Assist-Professors GRAVES, MCKNIGHT, DUNCAN, MR. MCKINNEY, MR. PENNOCK, MR. PARKER, MISS HUTSINPILLAR.

The course includes two exercises weekly, in the writing of short themes, the outlining and composition of essays and speeches, and the study of illustrative texts for structure and form.

3. BRIEF MAKING AND WRITTEN ARGUMENTATION. Two credit hours. First, second, and third terms. Prerequisite, Course 1. *M., F., at 10; Tu., Th., 9, 10, or 11.* Assistant Professor DUNCAN, MR. MCKINNEY, MR. BLANCHARD, MR. PENNOCK.

The course includes a study of the principles of logical analysis, evidence and argumentation; practise in writing briefs of noted speeches (Bouton's "Lincoln and Douglas Debate"); and in preparing original briefs with written arguments.

5. ADVANCED COMPOSITION. Two credit hours. Three terms. Prerequisite, Courses 1 and 2. *Tu., Th., at 11.* Assistant Professor GRAVES.

This course affords practise in one or more of the forms of composition studied in Courses 1 and 2 (exclusive of argumentation).

7. INTRODUCTION TO ENGLISH LITERATURE. Three credit hours. Three terms. No prerequisite course. *M., W., F., 8 to 9.* Professor BARROWS, MR. PENNOCK,

*Died Jan. 19, 1908.

Moody and Lovett's English Literature; literary analysis and interpretation; critical study of selections beginning with those in Manly's "English Poetry."

8. GENERAL SURVEY OF ENGLISH LITERATURE. Three credit hours. Three terms. No prerequisite course. *M., W., F., at 11 or 3.* Assistant Professors GRAVES and DUNCAN.

An extensive reading course intended especially for those whose scheme of work permits no further courses in English.

45. AMERICAN LITERATURE. Two credit hours. Three terms. *Tu., Th., at 8.* No prerequisite course. Associate Professor TAYLOR.

GEOLOGY

(Orton Hall)

PROFESSOR PROSSER, PROFESSOR BOWNOCKER, ASSISTANT
PROFESSOR HUBBARD

The University is able to present unusual advantages for the study of Geology. By an act of the Legislature it has been put in possession of all the collections made by the State Geological Survey, and these collections have been supplemented by valuable additions of fossils and minerals from various sources. This collection embraces a very complete representation of every geological formation shown in Ohio. Orton Hall, completed at a cost of more than \$100,000, is designed for the permanent accommodation of the large geological collection of the University and for the work and instruction in the department of Geology. A portion of it, at present, is occupied by the library and reading room. The building is two stories in height, with a high basement; is built of brick and faced with sandstone, and is fireproof throughout. Some of the material was contributed by various quarries of the State of Ohio, and almost all of the finer varieties of Ohio building stone are represented in the columns, walls, and ceiling panels of the vestibule.

1. ELEMENTARY PHYSIOGRAPHY. Five credit hours. Third term. *M., Tu., W., Th., F., at 11.* Assistant Professor HUBBARD.

The physiographic features of the earth's surface and the agen-

cies producing them; the atmosphere, and the ocean. Recitations, lectures, and map work. One period per week will be devoted to laboratory work.

2. GENERAL GEOLOGY. Five credit hours. First term. Lectures and recitations, *M., Tu., W., F., at 11*; laboratory, *Th.*, 8 or 9; field work, first half of term, *F.* afternoon or *S.* forenoon, when the *F.* lecture will be omitted. Professor PROSSER, Assistant Professor HUBBARD.

Structural, dynamical, and historical geology. The lectures are illustrated by maps, specimens, and lantern views. The common rock-forming minerals and rocks are studied in the laboratory; while in the field specimens are collected, sections measured, formations identified, and the student given an idea of the method of work pursued by a field geologist.

5. APPLIED GEOLOGY. Four credit hours. Second term. Lectures, *M., Tu., W., Th., at 8*; laboratory, *F., at 8*. Professor BOWNOCKER.

The common minerals and rocks composing the earth's crust, their disintegration and decomposition. Soils, their origin and classification; the soils of the United States, and especially those of Ohio. Fuels, coal, oil, and gas. Building stones, limes, and cements.

GERMANIC LANGUAGES AND LITERATURES

(University Hall, Rooms 30 and 32)

PROFESSOR RHOADES, ASSOCIATE PROFESSOR VILES, ASSISTANT PROFESSOR EISENLOHR, DR. THOMAS, DR. BUSSE.

1. ELEMENTARY. Four credit hours. Three terms. *M., Tu., Th., F., 10 or 11*; *Tu., W., Th., F., 9, 2, or 3*.

Elements of inflection and syntax, translation of easy prose, prose composition and practise in reproduction of texts read.

2. SCIENCE READING. Four credit hours. Third term. Prerequisite, first and second terms of Course 4. *Tu., W., Th., F., 8 or 9*.

4. INTERMEDIATE GERMAN. Four credit hours. Three terms. Prerequisite, Course 1, or two years High School work. *M., Tu., Th., F., 10 or 11*; *M., W., Th., F., 9, 2, or 3*.

Translation of standard prose, prose composition, and grammatical drill. In the third term the class will read one or more of the plays of Schiller.

HORTICULTURE AND FORESTRY.

(Horticultural Hall)

PROFESSOR LAZENBY, ASSISTANT PROFESSOR DAVIS

This department has about twenty-five acres of land. About one-half of this area has been planted with varieties of cultivated fruits. The remainder is devoted to market gardening. Among the facilities for instruction and illustration that deserve special notice are two vegetable forcing houses, with packing rooms, tool rooms, etc. These houses are attached to Horticultural Hall and are each one hundred and twenty feet long by twenty feet in width. They are heated by hot water. One interesting feature in the management of the forcing houses is the method of watering by sub-irrigation. This method had its origin in these houses, and marks a great step in advance in green-house management. Lettuce, radishes, cucumbers, parsley, cauliflower, onions, rhubarb, asparagus, and other vegetables are grown in the forcing houses during the college year. Among the additional facilities provided are (1) orchards, containing well-selected varieties of apple, pear, plum, cherry, and quince; (2) small fruit plantations, stocked with some of the best varieties of strawberry, raspberry, blackberry, currant, and gooseberry; (3) large vegetable gardens, with pipe-heated hot-beds, cold frames, conveniences for irrigation, experimental plats, etc.; (4) a small nursery and forest tree plantation, with practise rows for budding, grafting, pruning, and training; (5) ornamental grounds and native woodland, containing a large variety of evergreen and deciduous trees and shrubs; (6) a collection of seeds, woods, and other preserved natural specimens; (7) a collection of fruit in jars, also models of apples, etc.; (8) a laboratory well equipped with dry ovens, balances, seed testers, and other appliances for study and research; (9) a collection of horticultural hand tools for budding, grafting, pruning,

etc.; (10) a small apiary of a dozen or more colonies of bees.

1. ELEMENTS IN HORTICULTURE. Four credit hours. Three terms. Two-year courses in Agriculture and Horticulture. Lectures and recitations, *M., W., F., at 11*; laboratory or practicum, *W., 1 to 3*. Assistant Professor DAVIS.

A study of the principles of plant growth and culture, including tillage, drainage, irrigation, weeds, insects, etc., in their relation to horticultural crops.

2. VEGETABLE FORCING. Four credit hours. Second term. Lectures and recitations. Time to be arranged. Laboratory or practicum. Assistant Professor DAVIS.

A study of the history and development of different types of plant houses, including methods of heating, ventilating, and general management.

3. PLANT PROPAGATION. Four credit hours. Third term. Lectures and recitations, *M., W., F., at 9*; laboratory or practicum, *M., or F., 1 to 3*. Assistant Professor DAVIS.

The theory and practise of multiplying plants by seeds, layers, cuttings, grafts, and divisions; pruning and training; spraying, history of the development and use of insecticides and fungicides, together with a study of different remedies for particular insects and plant diseases.

5. VARIETIES OF CULTIVATED FRUIT. Four credit hours. First term. Lectures and recitations, *M., W., F., at 9*; laboratory and practicum, *F., 1 to 3*. Professor LAZENBY.

A study of the history, characteristics, adaptation, and general qualities of orchard and garden fruits, including their commercial and food values. The judging and scoring of apples, pears, peaches, grapes, citrous and nut fruits.

6. PRINCIPLES OF FRUIT CULTURE. Four credit hours. Second term. Lectures and recitations, *M., W., F., at 9*; laboratory and practicum, *M., or F., 1 to 3*. Assistant Professor DAVIS.

A study of the location, tillage, and fertilizing of orchards and gardens; the selection of varieties, laying out, planting, and general management of fruit plantations, harvesting, marketing and storing fruit.

14. OLERICULTURE. Four credit hours. Third term. Lectures and recitations. Time to be arranged. Assistant Professor DAVIS.
Principles of home and truck gardening, including a study of

the culture, soil, climate, and market conditions to be considered in relation to the various garden crops.

8. ORNAMENTAL PLANTS. Two credit hours. First term. Time to be arranged. Professor LAZENBY.

A study of the history, classification, general characteristics, propagation, and culture of ornamental plants, together with their uses for home and public grounds.

9. WINDOW GARDENING AND FLORICULTURE. Two credit hours. Second term. *Tu., Th., 8 or 9.* Professor LAZENBY.

Including the general management of house plants, the home conservatory, commercial greenhouse, and the propagation and uses of flowers and plants for decoration.

10. HOME GARDENING. Two credit hours. Third term. *Tu., Th., 8 or 9.* Professor LAZENBY.

The location, planting and management of the kitchen garden, and the laying out and treatment of the ornamental grounds about the home.

15. LANDSCAPE GARDENING. Three credit hours. Third term. *M., W., F., at 8; practicum, F., 1 to 3.* Professor LAZENBY.

A study of the art of producing picture-like or landscape effects; the making of lawns, walks, and drives, and the correct planting of trees, shrubs, and flowers for the external adornment of home and public grounds.

11. ELEMENTS OF FORESTRY. Five credit hours. First term. Lectures and recitations, *M., W., F., at 9; laboratory or practicum, Th., 1 to 3.* Professor LAZENBY.

Our native and introduced trees and shrubs treated individually and collectively; their use for timber, fuel, shelter, ornament, etc. Methods of propagation and culture.

12. FOREST TECHNOLOGY AND TIMBER PHYSICS. Five credit hours. Second term. Lectures and recitations, *M., W., F., at 9; laboratory or practicum, Th., 1 to 3.* Professor LAZENBY.

The principles and methods of establishing, improving, and managing woodlands; including the measurements and estimates of standing timber and harvesting of forest products; a study of the more important physical properties of wood.

13. FOREST ECONOMICS. Five credit hours. Third term. Lectures and recitations, *M., W., F., at 9; laboratory or practicum, Th., 1 to 3.* Professor LAZENBY.

The economic features of modern forestry; the influence of

forests upon climate, soils, and crop production; forest valuation, protection, and administration; forest laws and forest policies; forestry conditions in Ohio and other states.

16. NATURE STUDY. Two credit hours. First term. Lectures, recitations, and practicum, *Th.*, at 11; *M.*, 1 to 3. Assistant Professor DAVIS.

A course intended primarily for those who are or expect to become teachers; treating of the objects and aims of nature study, with lectures on some of the interesting things to be found everywhere about us, indicating how such material can be advantageously used by the teacher in class room work.

17. PLANT VARIATIONS. Two credit hours. Second term. Lectures and recitations. *Tu., Th.*, at 9. Professor LAZENBY.

A course designed for those interested in plant breeding and in the modification and improvement of plants by mutation, crossing, dwarfing, forcing, etc., together with a discussion of the current theories of evolution as applied to the variation and amelioration of plants under cultivation.

18. APICULTURE. Three credit hours. Second term. *Tu., Th.*, at 10; practicum, *Th.*, 1 to 3. Professor LAZENBY.

A course in the theory and practise of bee-keeping. Lectures, recitation, and practise.

19. POMOLOGY. Four credit hours. Three terms. Two-year courses in Horticulture and Agriculture. Assistant Professor DAVIS.

Including the propagation, pruning, cultivation, harvesting, marketing, etc., with special reference to the fruits commonly grown in the temperate zone.

INDUSTRIAL ARTS

(Hayes Hall, Rooms 5 and 17)

PROFESSOR SANBORN, MR. RENCK, MR. CROWE

The shops occupy the north wing of Hayes Hall and afford excellent facilities for instruction in both the practical details and the underlying principles of carpentry, pattern-making, and forging. The carpenter and pattern shops are equipped with twenty-five benches with complete sets of carpenter tools for each, twenty-four turning lathes with the necessary turning tools, a pony planer, a buzz planer,

a circular rip and cross-cut saw, a scroll saw, a band saw, a trimmer, and power grindstone. The forge shop is equipped with twenty stationary forges with anvils and tools for each, a heating forge, a portable hand forge, a foot power hammer, a blacksmith's drill and a punch, shear, and bar-cutter.

1. CARPENTRY AND PATTERN MAKING. *M., Tu., 1 to 4, or Th., F., 1 to 4; also Tu., Th., 9 to 12.*

Practise in carpentry, wood-turning, and pattern-making, including sawing, planing, mortising, framing, and other work involving the use of the ordinary carpenter tools; center and chuck turning, and the making of simple patterns.

2. FORGING. Time, same as Course 1.

The use and care of forge, fire, and tools; practise in iron and steel forging, including such operations as cutting, bending, drawing, upsetting, shaping, and welding iron; the making, hardening, and tempering of steel punches, drills, and cold chisels.

MATHEMATICS

(University Hall, Room 314)

PROFESSOR BOHANNAN, ASSISTANT PROFESSOR PRESTON

1. ELEMENTARY ALGEBRA. Five credit hours. First term. Venable. *M., Tu., W., Th., F., at 9.* Assistant Professor PRESTON.

3a. PLANE GEOMETRY. Five credit hours. Second term. Venable. *M., Tu., W., Th., F., at 9.* Assistant Professor PRESTON

MILITARY SCIENCE AND TACTICS

(Office, The Armory)

CAPTAIN GEORGE L. CONVERSE, U. S. A., RETIRED

The Military Department is open five days during each week of each term. Required of all students first and second year, unless excused by the Military and Gymnasium Board.

1. MILITARY DRILL. One credit hour. First and third terms. *M., Tu., W., at 11 or 4.*

2. MILITARY DRILL. One credit hour. Second term; Drill Regulations, *M., Tu., W., at 11 or 4; Gallery Practise, M., Tu., W., Th., 1 to 5.*

PHYSICAL EDUCATION FOR MEN

(Gymnasium)

DR. WINGERT, MR. WARFIELD, MR. KIBLER

1. GYMNASIUM. One credit hour. Three terms. A physical examination is required of all first year men during the early part of the fall term. Rational body building gymnastics and recreation, two hours per week during first year of student's residence at University, or until he has completed three terms of this work.

PHYSICAL EDUCATION FOR WOMEN

(Gymnasium and Armory)

MISS HOPKINS

1. GYMNASIUM. One credit hour. Three terms. Required of all young women during the first year of their course. *M., Tu., Th., F., 9 or 11.*

2. GYMNASIUM. One credit hour. Three terms. Required of all young women during the second year of their course. *M., Tu., Th., F., 8 or 10.*

PHYSICS

(Physics Building, First Floor)

PROFESSOR THOMAS, ASSISTANT PROFESSOR EARHART

1. ELEMENTARY PHYSICS. Five credit hours. First and second terms. *M., Tu., W., F., at 11.* One laboratory period per week required. Laboratory to be arranged. Assistant Professor EARHART.

Recitations and laboratory practise. Other courses in Physics may be elected by fourth-year students in Agriculture.

ROMANCE LANGUAGES AND LITERATURES

(Office, University Hall, Room 305)

PROFESSOR BOWEN, ASSOCIATE PROFESSOR BRUCE, ASSISTANT PROFESSOR
INGRAHAM, ASSISTANT PROFESSOR PEIRCE, MR. EWINGTON

FRENCH

1. ELEMENTARY FRENCH. Four credit hours. Three terms. Grammar: Fraser and Squair's or equivalent. Reader: Aldrich and Foster's, or Bowen's First Scientific. Historical and narrative prose; one or more prose comedies. Sec. I, *M., Tu., Th., F., at 9* (Arts

only); Sec. II, III, and IV, *M., Tu., Th., F., at 10*; Sec. V, *M., Tu., Th., F., at 11* (Agr. and Engin. only); Sec. VI, and VII, *Tu., W., Th., F., at 2*. All instructors in the department teach one or more sections of this course.

Stress laid upon the acquisition of a correct pronunciation, after which the entire energy of the student is directed toward the attainment of a full and accurate reading knowledge of the language. Grammar and composition made to contribute to this end. Sight reading emphasized.

2. MODERN FRENCH LITERATURE. Four credit hours. Three terms. Sec. I, and II, *M., Tu., Th., F., at 10*; Sec. III, *M., Tu., Th., F., at 11*. Prerequisite, Course 1 or equivalent. Associate Professor BRUCE, Assistant Professor PEIRCE, MR. EWINGTON.

The study of the literature as such now taken up. The work of the year deals with the following subjects: (1) Contes; (2) The Novel (Balzac or Hugo); (3) Lyric Poetry (Bowen's Modern French Lyrics); (4) Romantic Drama (Hugo). Prose composition. Systematic attention given to syntax and idiom. Lectures supplement the work. Private reading required.

SPANISH

1. ELEMENTARY SPANISH. Four credit hours. Three terms. Grammar (Hills' and Ford's or Edgren's), and Ingraham's *Victoria y Otros Cuentos*. Easy prose and plays. Composition and conversation. Sec. I, *M., Tu., Th., F., at 9*; Sec. II, *M., Tu., Th., F., at 11*; Sec. III and IV, *Tu., W., Th., F., at 2*. Assistant Professor INGRAHAM, Assistant Professor PEIRCE, MR. EWINGTON.

2. MODERN SPANISH LITERATURE. Four credit hours. Three terms. *Tu., W., Th., F., at 3*. Prerequisite, Course 1 or equivalent. Assistant Professor INGRAHAM.

The Modern Novel and Drama. Lectures covering a survey of the literature. Composition and conversation continued.

RURAL ECONOMICS

(Townshend Hall)

PROFESSOR PRICE

The subject of Rural Economics has received comparatively little attention until recently by American agricultural colleges, and, at the present time, there is little uniformity in the treatment of the subject in the different institutions

in which it is offered. The department includes instruction in Farm Management, History of Agriculture, and Agricultural Economics.

The facilities offered for the study of Farm Management include the University farm, containing over three hundred acres, and the records that have been kept of its operations for many years. Adjoining Columbus, and within reach by electric cars, there are many well equipped and well managed farms, which are frequently visited by classes in this department.

For the study of the History of Agriculture and Agricultural Literature, the University Library offers excellent facilities in the large number of agricultural works which it contains and the complete files of agricultural periodicals. In the study of Agricultural Economics access is had to the State Library, as well as the University Library, and excursions are made in the State to investigate agricultural conditions.

1. RURAL ECONOMICS. Four credit hours. Third term. Two-year courses in Agriculture and Horticulture. Professor PRICE.

Lectures, recitations, and visits to farms in the vicinity of Columbus. The course will include a comparative study of the different systems of farm management; the cost of producing and marketing farm products; methods of renting, leasing, and operating farm lands; and keeping farm accounts and records.

2. FARM MANAGEMENT. Four credit hours. First term. *M., Tu., Th., F., at 11.* Professor PRICE.

Lectures and recitations upon the problems of farm management, the relative profits of different systems of farm management, and their effect upon maintaining the fertility of the land. The business of farming from the standpoint of the individual is studied.

4. HISTORY AND LITERATURE OF AGRICULTURE. Four credit hours. Second term. *M., Tu., Th., F., at 11.* Professor PRICE.

Lectures and recitations upon the history of agriculture and the evolution of agricultural methods, with special reference to the agriculture of the present day. The development of agricultural literature, together with literature of the present and current periodicals, are studied.

6. AGRICULTURAL ECONOMICS. Four credit hours. Third term. *M., Tu., Th., F., at 11.* Professor PRICE.

Lectures and recitations upon the production, distribution, transportation, and marketing of agricultural products. The relation of the industry of agriculture to other industries, co-operation in agriculture, agricultural organizations, and the social conditions of agriculture are considered.

SHOP WORK

(See Industrial Arts)

SPANISH

(See Romance Languages)

VETERINARY MEDICINE

(Veterinary Laboratory)

PROFESSOR WHITE, PROFESSOR SISSON

Students in Agriculture taking required or elective work in Veterinary Medicine can avail themselves of the whole equipment of the College of Veterinary Medicine. For the class room work a large number of papier-mache models, wet and dry anatomical specimens, sample horse-shoes, charts, diagrams and drawings, surgical instruments, and apparatus are constantly employed to supplement textbook teaching. The Veterinary Hospital affords excellent facilities for the care and treatment of diseased and injured animals.

The new Veterinary Laboratory building is especially designed for the teaching of Veterinary Medicine. It contains the Veterinary Museum, probably the largest in the country, a modern sanitary dissecting room, and laboratories for anatomy, pharmacology, pathology, and bacteriology.

28. VETERINARY ANATOMY. Four credit hours. First term. Recitations, *M., Tu., Th., F., at 10.* Professor SISSON.

Brief outline of the anatomy of the horse and ox.

29. VETERINARY PRACTISE. Four credit hours. Second term. Recitations, *M., Tu., Th., F., at 10.* Professor WHITE.

The more common diseases of a non-infective character, to which farm animals are subject. Minor surgery, castration, and the principles of horseshoeing are included in this course.

30. VETERINARY HYGIENE AND SANITATION. Four credit hours. Third term. Recitations, *M., Tu., Th., F., at 10.* Professor WHITE.

The more common diseases of a non-infective character to farm and dairy animals, and the most scientific methods of preventing, dealing with, and treating the same.

ZOOLOGY AND ENTOMOLOGY

(Biological Hall, Rooms 3, 4, 7, 8, and 9)

PROFESSOR OSBORN, ASSOCIATE PROFESSORS HINE AND LANDACRE

Work in this department is largely on the laboratory plan, the effort being to have each student become familiar with typical forms of animal life, acquire the power to discover facts for himself, and use them in practical applications. Animals that have an important economic relation are used as examples for their respective groups. While the aim is to give a thorough and sound training in the underlying principles of Zoology and Entomology, the practical bearing of these is shown by use of such forms as the liver fluke of sheep to show effects and relations of parasitism, the earth-worm in its relation to soil formation, trichina as affecting human health and meat exports, insects, both useful and injurious, fishes as a source of food, relation of birds to insect control and importance of certain groups of birds and mammals as the source of our domestic animals. Advanced and graduate courses provide for training in methods of research, and especial attention is given to preparation for investigation as experiment station workers.

1. INVERTEBRATE AND VERTEBRATE. Three credit hours. Invertebrate, first and second terms; Vertebrate, third term. *Tu., Th., at 8, or M., F., at 10; M., or W., or F., 1 to 3.* Professor OSBORN, Associate Professor LANDACRE.

This course includes a general discussion of groups, dissection of types, and an outline of classification. Especial attention is given to forms of economic importance either from their detrimental effects on crops, stock, etc., or from their utility in various industries or as domestic species.

3. ECONOMIC ENTOMOLOGY. Three credit hours. Third term. Lecture, *Tu., Th., at 8*; laboratory, *M., F., 10 to 12*. Prerequisite, Course 4. Associate Professor HINE.

Insects of forest, orchard, and garden. A detailed study of injurious species intended particularly for students of Horticulture. The work includes field studies, collections, reports on observation, etc.

4. ECONOMIC ENTOMOLOGY. Three credit hours. Three terms. Lecture, *Tu., Th., at 8*; laboratory, *M., F., 10 to 12*. Prerequisite, Course 1. Associate Professor HINE.

A systematic study of groups of insects, with special reference to injurious and beneficial species. A foundation is laid for special study in Entomology. Preparation of collections, essays, life studies, and use of remedial measures along with laboratory studies on general anatomy.

7. SYSTEMATIC AND PRACTICAL ENTOMOLOGY. Four credit hours. Elective in short course in Agriculture, first, second and third terms; required in first year of short course in Horticulture. Lectures, laboratory, and field work. Time to be arranged. Associate Professor HINE.

8. PARASITES OF DOMESTIC ANIMALS. One credit hour. First term. Elective. Time to be arranged. Professor OSBORN.

A lecture course devoted to the principal parasites affecting domestic animals, intended especially to meet the needs of those who intend to give particular attention to stock raising.

9. SPECIAL ENTOMOLOGY. Four credit hours. First term. Elective in Junior or Senior year. Time to be arranged. Professor OSBORN.

Studies of life histories, collection, and classification in selected groups. Field work and lectures.

10. SPECIAL ENTOMOLOGY. Four credit hours. Second term. Elective in Junior or Senior year. Time to be arranged. Professor OSBORN.

Studies of winter condition of insects. Insecticides, insecticide machinery, methods of preparing insect illustrations, greenhouse pests, etc.

11. SPECIAL ENTOMOLOGY. Four credit hours. Third term. Elective in Junior or Senior year. Time to be arranged. Professor OSBORN.

Investigations of selected groups or species. Lectures on insect legislation, distribution, natural enemies, special methods of control, etc.

[Courses 9, 10, and 11 are intended as practical courses in entomological research, adapted especially for those who wish to give special attention to this branch with reference to future work in Agriculture or Horticulture, and to furnish a preparation for those who have in view work as entomological investigators in experiment stations or as teachers in agricultural schools. They may be taken as graduate courses if not elected earlier, or continued as special lines of research during a graduate course embracing other special subjects.]

26. ZOOLOGICAL SEMINAR. One credit hour. Three terms. Time to be arranged. Professor OSBORN, Associate Professors LANDACRE and HINE.

Discussion of recent literature in Zoology and Entomology, reviews of progress in certain lines of investigation and presentation of research studies. Advanced students in Zoology and Entomology are expected to elect this course, and it is open to others who have had preliminary courses.

GENERAL INFORMATION

REGISTRATION AND EXPENSES

Students will be required to register Tuesday, September 22, 1908, and class work in all departments will begin the following day. Former students who fail to register as above will be charged one dollar, in addition to the usual incidental fee, for the first day of delinquency, and fifty cents additional for each subsequent day.

COLLEGE DUES

Each student is required to pay an incidental fee of six dollars a term.

A laboratory fee of one dollar per term is charged in all courses in which laboratory work is given, and students are required to pay for materials used in laboratories in addition to the laboratory fees.

The gymnasium is free to all students, but those desiring a locker will be charged a fee of one dollar a term.

All term dues must be paid at the opening of each term as a condition of admission to classes.

A fee of five dollars to cover expenses of graduation, diplomas, etc., is required of each person receiving one of the ordinary degrees from the University, and this fee must be paid before the degree is conferred.

OTHER EXPENSES

Boarding clubs are formed in the neighborhood of the University. Furnished rooms are rented at seventy-five cents to one dollar and twenty-five cents a week for each student, and the cost of table board is two and one-half dollars to four dollars a week.

Board with furnished rooms can be obtained in pri-

vate families, within convenient distances of the University, at rates varying from four dollars to five dollars a week.

The uniform with which the members of the regiment are required to provide themselves costs (without overcoat) about fourteen dollars. It is quiet in pattern, and is designed to be worn daily in place of civilian dress.

The expenses of a student in the University for a year may be estimated as follows, excluding clothing (except uniform) and traveling expenses:

	Low.	Average.	High.
Incidental fees	\$ 18 00	\$ 18 00	\$ 18 00
Laboratory materials ..	15 00	15 00	25 00
Books and stationery..	15 00	25 00	40 00
Room	35 00	37 00	75 00
Furniture	10 00
Board	90 00	115 00	175 00
Uniform	14 00	14 00	14 00
	<hr/>	<hr/>	<hr/>
	\$197 00	\$224 00	\$347 00

The second and third estimates for room include light, fuel, and care. The third estimate is for a room occupied by a single student. The requirements for laboratory fees and books depend upon the course of study pursued. There is no need of a student spending more than the "average" for the items mentioned; many spend less.

FREE SCHOLARSHIPS

A free scholarship, good for two years in the College of Agriculture and Domestic Science, is granted to one student annually from each county in Ohio, but not more than two scholarships can be in force at any one time from any county.

Each scholarship is valid for two years from its grant, and covers incidental and fixed laboratory fees. In the chemical laboratories a student holding a free scholarship shall be required to pay for materials used and to make a

deposit to cover breakage the same as other students. In case of other than new students the scholarship will be accepted only after approval by the Board of Trustees. All scholarships must be presented to the Secretary of the Board of Trustees on or before November 1st of the year in which they are to be used, otherwise they are not valid.

The free scholarship cannot be used in the special winter term courses. The appointments are made by the County Boards of Agriculture, and are not transferable by the appointees. To learn whether the scholarship of a given county for the current year has been granted, inquiry should be addressed to the Secretary or President of the County Agricultural Society. For further information concerning these scholarships, inquiries should be addressed to the Dean of this College.

CHRISTIAN ASSOCIATIONS

The Young Men's Christian Association has come to occupy a prominent place in university life. It has a membership of four hundred and forty-eight men, and is affiliated with the World's Student Christian Federation. The Association House furnishes free for the use of its members a reading room, library, magazines and papers, piano, and telephone—a college home.

Religious meetings are held for men on Sunday afternoon; there are also frequent meetings for the promotion of social intercourse and good fellowship. Courses in systematic Bible study and in modern missions are offered. A most helpful feature of the work is that in the interest of new students at the opening of the school year. Desirable rooms and boarding places are found and posted for reference at the Association House. Representatives of the Association meet the trains, assist students in finding satisfactory locations, and endeavor in every way to make them feel at home. The Employment Bureau helps to find work.

A copy of the Students' Handbook, giving information about Columbus, the University, and the various college organizations and activities, will be sent free to prospective students. For this handbook or for further information, address the General Secretary of O. S. U. Y. M. C. A., 39 West Tenth avenue, Columbus, Ohio.

The Young Women's Christian Association holds religious meetings regularly at noon on Tuesdays. This organization is active and efficient in working for the higher interests of the young women. Young women planning to enter the University are invited to correspond with reference to board or rooms with the General Secretary, O. S. U. Y. M. C. A., University Hall, Columbus, Ohio.

SELF SUPPORT

There is a large amount of work on the University farm and campus and in the gardens, orchards, and greenhouses, which can be done by students, for which they are paid at current rates for such labor, and each year several thousand dollars are paid out in this way. By this means, together with what can be earned by steady labor during the summer vacation, a considerable number of students defray all their expenses.

Preference is given to students who are willing to devote a certain number of hours each day to the work assigned.

Work cannot be promised to all applicants, and is not guaranteed to any.

Applications for employment should be made to the Superintendent of the University farm. Labor blanks will be furnished upon request.

CADET SERVICE

Under the law of Congress establishing the University, it is required that instruction shall be given in military

science and tactics, and the Trustees have directed that all male students, except those in the College of Law, and such others as may be specially excused for physical disability or for having reached the age limit of twenty-five years, shall render two years of cadet service as a condition of graduation. A uniform has been prescribed, with which each member is required to provide himself.

PHYSICAL EDUCATION

Physical Education is conducted under the direct supervision of the Director, who is a graduate physician and a member of the University Faculty. He is assisted by an associate director for women, also an assistant and twenty student aids, who are selected each year from the upper classmen and those who show proficiency in their work. The main floor of the gymnasium (80 by 150 ft.) is thoroughly equipped with the most modern gymnastic apparatus. It is used by the women in the forenoon while the men exercise in the new gymnasium on the first floor. In the afternoon the main floor is used exclusively by the men for class work, athletics, basketball, recreative games, etc. Regular class exercise two hours per week is required during the first year of a student's residence at the University or until he has successfully completed three terms of this work. A thorough physical examination is made of each student at the opening of the college year. Physical defects, abnormalities, and weaknesses are noted, and judicious, healthful exercise is prescribed to fit the student's individual needs.

DESCRIPTION OF SUBJECTS ACCEPTED FOR ADMISSION TO THE COURSES LEADING TO A DEGREE.

(A) ENGLISH GROUP

ENGLISH COMPOSITION AND RHETORIC. One unit. Each applicant must be able to write clear and correct English, and no applicant will be accepted in English whose work is seriously defective in spelling, punctuation, grammar, and paragraph structure. The proper preparation for this part of the requirement is practice in composition through the four preparatory years, with correction of themes by the teacher and revision by the pupil. Subjects for themes should be taken from the books prescribed for general reading below and also from the pupil's observation and experience. Practice should be afforded in writing narrative, descriptive, exposition and argumentation. Applicants should be familiar with those principles of Rhetoric which are most helpful in elementary composition; viz., the principles of sentence structure, outlining, paragraphs, and choice of words. The amount and kind of work required is indicated in Scott and Denney's *Elementary Composition and Composition-Literature*.

ENGLISH CLASSICS. One unit. (a) A thorough knowledge of the subject-matter, form, and structure of Shakespeare's *Macbeth*, Milton's *Lycidas*, *Comus*, *L'Allegro*, *Il Penseroso*; Burke's *Speech on Conciliation with America* (or Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*); Macaulay's *Life of Johnson* (or Carlyle's *Essay on Burns*). (b) A general knowledge of the substance of ten books selected from the following groups: Group 1 (two to be selected), Shakespeare's *As You Like It*, *Julius Cæsar*, *Merchant of Venice*, *Twelfth Night*, *Henry the Fifth*; Group 2 (one to be selected), Bunyan's *Pilgrim's Progress*, part 1; Bacon's *Essays*, *The Sir Roger de Coverley Papers in The Spectator*, Franklin's *Autobiography*; Group 3 (one to be selected), Chaucer's *Prologue*, selections from Spenser's *Faerie Queene*, Pope's *Rape of the Lock*, Goldsmith's *Deserted Village*, Palgrave's *Golden Treasury*, first series, books ii and iii, with special attention to Dryden, Collins, Gray, Cowper, and Burns; Group 4 (two to be selected), Hawthorne's *House of the Seven Gables*, Thackeray's *Henry Esmond*, George Eliot's *Silas Marner*, Dickens' *A Tale of Two Cities*, Scott's

Ivanhoe, Quentin Durward, Goldsmith's *Vicar of Wakefield*, Mrs. Gaskell's *Cranford*, Blackmore's *Lorna Doone*; Group 5 (two to be selected), Emerson's *Essays* (selected), Ruskin's *Sesame and Lilies*, Irving's *Sketch Book*, Carlyle's *Heroes and Hero Worship*, De-Quincey's *Joan of Arc and the English Mail Coach*, Lamb's *Essays of Elia*; Group 6 (two to be selected), Palgrave's *Golden Treasury*, first series, book iv, with special attention to Wordsworth, Keats, and Shelley, Coleridge's *Ancient Mariner*, Lowell's *Vision of Sir Launfal*, Scott's *Lady of the Lake*, Poe's *Poems*, Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, *The Passing of Arthur*, Arnold's *Sohrab and Rostum*, Byron's *Mazeppa*, *The Prisoner of Chillon*, Macaulay's *Lays of Ancient Rome*, and Browning's *Cavalier Tunes*, *Lost Leader*, *How They Brought the Good News*, *Evelyn Hope*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *The Boy and the Angel*, *One Word More*, *Herve Riel*, *Pheidippides*.

ENGLISH LITERATURE. One unit. A good knowledge of the leading facts in the history of English Literature, as given in Scudder's *English Literature*, Johnson's *History of English and American Literature*, or the Introductions by Pancoast, Painter, Halleck, or Newcomer; together with the reading of representative works of literature. This may be offered in lieu of the work in English Classics.

(B) HISTORY GROUP

CIVIL GOVERNMENT. One-half unit. A good knowledge of the origin, principles, forms, and powers of the national, state, and local governments is expected. Fiske's *Civil Government*, with a special study of the state from which the student comes, may serve to indicate the amount and kind of knowledge sought.

UNITED STATES HISTORY. One-half or one unit. A good knowledge of the main facts and features of American History, especially of the period since 1750, is expected. McLaughlin's *History of the American Nation*, Montgomery's *Student's American History* or Hart's *Essentials in American History* will serve to show the kind and amount of knowledge sought. No credit upon certificate will be accorded in this subject for work done below the ninth grade.

GENERAL HISTORY OF MEDIAEVAL AND MODERN HISTORY. One or one-half unit. Adams' *European History* or Harding's *Essentials in Mediæval and Modern History*, Myers' *Mediæval and Modern History* (revised), or an equivalent.

GREEK AND ROMAN HISTORY. One-half or one unit. Botsford's Ancient History for Beginners, or West's Ancient World, or Wolfson's Essentials in Ancient History, or an equivalent.

ENGLISH HISTORY. One-half or one unit. Higginson and Channing's English History for Americans, or Walker's Essentials in English History, or Cheyney's Short History of England, or an equivalent.

(C) MATHEMATICS GROUP

ALGEBRA. One unit. Wells, Wentworth, Milne, or an equivalent. Special attention should be given to the four fundamental operations (single and system), factoring, highest common factor, lowest common multiple, fractions and fractional equations, involution, evolution, surds, complex quantities, quadratic equations solved by factoring, by completing the square and the general formula.

ALGEBRA. One-half unit. A thorough review of the work above named, irrational equations, simultaneous quadratic equations, higher equations solvable by factoring, ratio, proportion, progressions, theory of exponents, binomial theorem for positive integral exponents, and use of five-place tables of logarithms. It is recommended that this work be taken in the last year of the high school course.

GEOMETRY. One unit. Venable, White, Wells, Wentworth, Beman and Smith, or an equivalent. Plane geometry with solution of originals.

GEOMETRY. One-half unit. Solid and spherical geometry, with solution of originals given in the text-books named above.

(D) SCIENCE GROUP

PHYSICS. One unit. Carhart and Chute's Elements, Gage's Elements, Avery's Elements, Millikin and Gale's First Course in Physics, or an equivalent. Four recitation periods per week, including drill on simple numerical problems is recommended. A laboratory period of not less than two hours per week, to accompany the work of the text-book, is strongly urged, but is not required for the present.

PHYSICAL GEOGRAPHY. One-half or one unit. Tarr's, Dryer's, Davis', or Gilbert and Brigham's Physical Geography. The class work should be accompanied by a study of the physiographic forms and processes to be seen near the school.

BOTANY. One-half or one unit. Equivalent of the work outlined in an elementary text-book (such as Coulter's, Bailey's, Ber-

gin's, Andrews', Leavitt's, Barnes', Atkinson's, or Stevens'), and of a small handbook of the local flora (Kellerman's Spring Botany).

CHEMISTRY. One unit. McPherson and Henderson's Elementary Study of Chemistry, together with the Exercises in Chemistry arranged to accompany the same, or an equivalent. The course should consist of at least three recitations and four hours of laboratory work weekly throughout the year.

PHYSIOLOGY. One-half unit. Colton's Briefer Course, or an equivalent. No credit will be accorded in this subject for work done below the ninth grade.

ZOOLOGY. One-half or one unit. Jordan, Kellogg, and Heath's Animal Studies, Kellogg's Elementary Zoology, Davenport's Introduction, or equivalents, with laboratory or field work.

GEOLOGY. One-half unit. Brigham's, Dana and Rice's (revised), Tarr's, or LeConte's may be used as texts. The recitations should be supplemented by study of the geological phenomena and formations found in the vicinity of the school.

ELEMENTARY AGRICULTURE. One-half unit. Texts: Jackson and Dougherty or Bailey.

(E) FOREIGN LANGUAGE GROUP

LATIN. Two units. Pronunciation (Roman method); Grammar (an exact knowledge of the inflections). Cæsar, the first four books of the *De Bello Gallico*. Third unit. Cicero, six orations of Cicero, including *Pro Lege Manilia*. Fourth unit. Vergil, the first six books of the *Æneid* with prosody; and prose composition, Daniel, Collar, Bennett, Dodge and Tuttle, or Pearson, entire. Latin cannot be continued as a university study unless at least three units are offered for admission. Pupils should be trained to the systematic use of one of the standard Latin grammars from the outset.

GREEK. Two units. Grammar (Goodwin's preferred) and Prose Composition; or White's First Greek Book. Reading: The first three books of Xenophon's *Anabasis*. A third unit will be allowed for preparation in the fourth, fifth, and sixth books of the *Anabasis* and three books of Homer's *Iliad*, and a fourth unit for additional reading in Greek.

GERMAN. Two units. The pupil must possess a good pronunciation and be able to read or to translate at sight easy narrative prose, showing an exact and ready knowledge of the declensions

and conjugations of the language. The ordinary principles of syntax and of word-order must be thoroughly mastered and such knowledge shown by the ability to translate easy sentences into German. Some three hundred pages of simple prose and poetry must be read.

Four units. In addition to the above, the applicant must have had two years more of instruction, including the reading of from four to five hundred pages of standard prose and at least one of Schiller's dramas, with not less than fifty pages of work in prose composition. One-half of this latter amount may be offered for a third unit.

FRENCH. Two units. Applicants should be able to pronounce French accurately, to read at sight easy French prose, to put into French simple English sentences taken from the language of everyday life or based upon a portion of the French text read, and to answer questions on the rudiments of the grammar as defined below. During the first year the work should comprise: (1) Careful drill in pronunciation; (2) the rudiments of grammar, including the inflection of the regular and the more common irregular verbs, the plural of nouns, the inflection of adjectives, participles, and pronouns; the use of personal pronouns, common adverbs, prepositions, and conjunctions; the order of words in the sentence and the elementary rules of syntax; (3) abundant easy exercises, designed not only to fix in the memory the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; (4) the reading of from 100 to 175 duodecimo pages of graduated texts, with constant practise in translating into French easy variations of the sentences read (the teacher giving the English), and in reproducing from memory sentences previously read; (5) writing French from dictation. During the second year the work should comprise: (1) The reading of from 250 to 400 pages of easy modern (nineteenth century) prose in the form of stories, plays or historical or biographical sketches; (2) constant practise, as in the previous year, in translating into French easy variations upon the texts read; (3) frequent abstracts, sometimes oral and sometimes written, of portions of the text already read; (4) writing French from dictation; (5) continued drill upon the rudiments of grammar, with constant application in the construction of sentences; (6) mastery of the forms and use of pronouns, pronominal adjectives, of all but the rare irregular verb forms, and of the simpler uses of the conditional and subjunctive.

Three units. In addition to the above, applicants must have had a third year of instruction and should be able to read at sight

ordinary French prose or simple poetry, to translate into French a connected passage of English based on the text read, and to answer questions involving an adequate knowledge of syntax.

Four units. In addition to the above, applicants must have had a fourth year of instruction, and should be able to read at sight, with the help of a vocabulary of special or technical expressions, difficult French not earlier than that of the seventeenth century; to write in French a short essay on some simple subject connected with the works read; to put into French a passage of easy English prose and to carry on a simple conversation in French.

SPANISH. Two units. Applicants should be able to pronounce Spanish accurately, to read at sight easy Spanish prose, to put in Spanish simple English sentences taken from the language of everyday life or based upon a portion of the Spanish text read, and to answer questions on the essentials of the grammar. The first year should be spent mainly on the grammar, with easy reading and oral practise; the second devoted to reading good modern Spanish, with grammatical analysis and exercises in writing. The texts read should be chiefly narrative and conversational prose, including one or more prose dramas of the present age.

Three units. In addition to the above, applicants must have had a third year of instruction, and should be able to read at sight ordinary Spanish prose or simple poetry, to translate into Spanish a connected passage of English based on the text read, and to answer questions involving an adequate knowledge of syntax.

Four units. In addition to the above, applicants must have had a fourth year of instruction, and should be able to read at sight, with the help of a vocabulary of special or technical expressions, difficult Spanish, whether prose or poetry; to write in Spanish a short essay on some simple subject connected with the works read; to put into Spanish a passage of easy English prose, and to carry on a simple conversation in Spanish.

LIST OF ACCREDITED AND RECOGNIZED SCHOOLS IN OHIO.

Accredited schools are those four-year secondary schools whose courses of study have been found by inspection to be capable of satisfactorily preparing students for all colleges of the University.

Recognized schools are those three or four-year secondary schools whose courses of study are not capable of preparing students for all colleges of the University, but which have been found by inspection to cover satisfactorily 10 units of the requirements for admission.

These lists are subject to change from year to year as schools are revisited. Persons are advised, therefore, to consult the latest bulletins and catalogues of the University. A shows that a school is accredited; R, that it is recognized.

School	Superintendent	Principal
Akron, A	H. V. Hotchkiss	D. C. Rybolt
Alliance, R	J. E. Morris	J. E. Vaughan
Andover, R	S. A. Harbourt	Mary McDonald
Arcanum, R	C. E. Thomas	H. L. Senseman
Ashland, R	E. P. Dean	F. C. Clark
Ashtabula, A	E. A. Hotchkiss	Lillian Kurtz
Ashville, R	Stanley Lawrence	
Athens, A	B. O. Skinner	Zella Foster
Baltimore, R	J. H. Horton	J. J. Wagner
Barberton, R	J. M. Carr	G. M. Korns
Barnesville, A	W. R. Butcher	A. J. Gerber
Batavia, R	B. S. Timmons	
Bedford, R	H. L. Rawdon	Miss G. E. Thomas
Bellaire, A	J. R. Anderson	Alice Cunningham
Bellefontaine, A	J. W. MacKinnon	Annie A. Price
Bellevue, R	E. F. Warner	H. C. Bates
Bethel Township, Clark Co., R	Alfred Ross	Irene Dornblaser
Bethel Township Miami Co., R	R. W. Crist	Walter Peoples
Blanchester, R	C. L. Leahy	Elizabeth Chaney
Bluffton, R	C. A. Arganbright	I. W. Geiger
Bowling Green, A	N. D. O. Wilson	
Bryan, A	J. W. Wyandt	Orville Smith
Bucyrus, A	W. N. Beethan	C. H. Miller
Cadiz, R	J. R. Lehman	S. L. Eby
Caldwell, R	C. J. Foster	Patrick Henry
Cambridge, A	H. Z. Hobson	John H. Harding
Camden, R	J. L. Fortney	L. D. Brouse
Canal Dover, A	F. P. Geiger	A. J. Huffman

School	Superintendent	Principal
Canal Winchester, R	A. A. McEndree	Chas. A. Armstrong
Canton, A	John K. Baxter	Mattie Myers
Carey, R	A. J. Nowlan	Louise Sherer
Carthage, R	C. A. Wilson	J. W. Pogue
Celina, R	S. Wilkin	Jessie King
Chardon, A	W. R. Davis	W. H. Rice
Chillicothe, A	M. E. Hard	
Cincinnati—	F. B. Dyer	
Hughes, A		E. W. Coy
Walnut Hills, A		W. T. Harris
Woodward, A		E. D. Lyon
Cin. Tech. School, A		L. M. Ballou
Circleville, A	C. L. Boyer	W. E. Sealock
Cleveland—	W. H. Elson	
Central, A		Edward L. Harris
East, A		B. U. Rannells
Lincoln, A		James W. McLane
South, A		G. A. Reutenik
West, A		C. L. Lynch
Glenville, A		H. H. Cully
Cleveland Heights, A	C. A. Tilden	C. A. Tilden
Clintonville, R	W. S. Jennings	
College Corner, R	C. E. Gillespie	Edith Francisco
Collinwood, A	Frank P. Whitney	F. C. Rulon
Columbus—	Jacob A. Shawan	
Central, A		W. M. Townsend
East, A		F. B. Pearson
North, A		C. D. Everett
South, A		C. S. Barrett
Columbus School for		{ Miss G. L. Jones
Girls, A		{ Miss Alice Gladden
Columbus Grove, R	J. T. Begg	M. L. Allstetter
Conneaut, R	Calvin T. Northrop	Louise E. Kahler
Corning, R	F. W. Huston	
Coshocton, A	Herman S. Piatt	C. E. Bryant
Covington, R	L. J. Bennett	D. H. Sellers
Cumberland, R	G. E. Bell	W. S. Kingston
Cuyahoga Falls, R	R. W. Solomon	H. O. Bolich
Dayton, A	J. W. Carr	Chas. L. Loos, Jr.
Defiance, R	F. E. Reynolds	
Delaware, A	W. McK. Vance	Maude I. Myers
Delphos, A	T. W. Shimp	I. F. Matteson
Delta, R	G. W. Hoffman	Viola Wilkins
DeGraff, R	N. H. Stull	
Dennison, R	W. H. Angel	A. J. Fry
Dresden, R	E. E. Smock	Blanche E. Baker
East Cleveland, A	W. H. Kirk	
East Liverpool, A	R. E. Rayman	Florence Updegraff
Eaton, A	F. B. Bryant	John O'Leary
Elyria, A	W. R. Comings	H. M. Ebert
Euclid, R	H. D. Rankin	Mary E. Gould

School	Superintendent	Principal
Fayette, R	C. D. Perry	E. N. Hoover
Findlay, A	J. W. Zeller	J. F. Smith
Fort Recovery, R	James Ross	(Mrs.) J. A. Hunter
Fostoria, A	S. H. Layton	Ida McDermott
Franklin School, (Cincinnati), A		{ Joseph E. White
Fredericktown, R	W. W. Borden	{ G. S. Sykes
Fremont, A	J. E. Collins	Anna B. Beattie
Friends' Boarding School (Barnes- ville), R		H. M. Lowe
Galion, A	I. C. Guinther	B. J. Thomas
Gallipolis, A	H. E. Conard	Louise John
Garrettsville, R	E. F. Robison	L. W. McKinnon
Geneva, R	J. E. Fitzgerald	E. A. Barnes
Georgetown, A	A. F. Waters	T. E. Hughes
Germantown, A	C. W. McClure	S. M. Heitz
Gibsonburg, R	S. H. Benson	Mary E. Baker
Glendale, A	E. H. Foster	Mary S. Evans
Grand River Insti- tute, A		O. J. Luethi
Granville, R	J. R. Clements	Flora Hoover
Greenfield, A	E. W. Patterson	Roy Harris
Greenville, A	W. S. Rowe	J. L. Selby
Greenwich, A	J. H. Diebel	Ethel M. Hurst
Grove City, R	A. C. Fries	C. F. Neiswander
Groveport, R	M. C. Warren	J. F. Paxton
Hamilton, A	Darrell Joyce	W. P. Cope
Harmony Township (Clark Co.), R	David Neer	Carlton Henry
Hartwell, A	J. S. Trisler	J. C. Mauchley
Harrison, R	Thos. P. Pierce	Mary A. Curran
Harrison Township, (Mont. Co.), R	D. W. Klepinger	A. E. Clagett
Hicksville, R	J. M. Beck	C. C. Nardin
Highland, R	C. W. Johnson	Bessie L. Smith
Hilliards, R	Chauncey Lawrence	J. B. Phillips
Hillsboro, A	F. H. Warren	W. E. Arter
Home City, R	J. O. Falkenburg	Inez M. White
Ironton, A	S. P. Humphrey	R. G. Russell
Jackson, A	J. E. Kinnison	M. A. Henson
Jefferson, A	H. S. Foote	Mary I. Hoskins
Kent, R	R. P. Clark	W. A. Walls
Kenton, A	N. E. Hutchinson	
Kingsville, R	E. W. Hamblin	
Kirtland, R		
Lakeside, A	H. O. Hannah	Margaret Hull
Lakewood, A	J. M. H. Frederick	H. W. Kennedy
Lancaster, A	H. A. Cassidy	W. C. Brashares
Lebanon, R	J. M. Hamilton	L. F. Coleman
Leetonia, R	J. W. Moore	L. A. Herdle

School	Superintendent	Principal
Leipsic, R	W. S. Sackett	Florence B. McClure
Lima, A	J. A. Davidson	S. Steffens
Lisbon, R	W. O. Lambert	R. C. Schroth
Lockland, A	S. T. Dial	Howard Hollenbach
Logan, A	H. F. Silverthorn	
London, A	Wm. McClain	Marion Schlesinger
Lorain, R	A. C. Eldredge	D. J. Boone
Madison, R	Geo. C. Von Beseler	Lois Ellet
Madison Township (Pickaway Co.), R		
Madisonville, A	C. M. Merry	(Mrs.) J. M. Bryan
Mad River Township (Enon Village), R	J. R. Clark	O. P. Hause
Malta, R	George M. Strong	L. E. Coulter
Mansfield, A	H. H. Helter	Harland E. Hall
Marietta, A	J. V. McMillan	W. H. Maurer
Marion, A	H. L. Frank	C. H. Winans
Martins Ferry, A	L. E. York	O. C. Hursch
Marysville, A	L. B. Demorest	
Massillon, A	C. L. Cronebaugh	
Mechanicsburg, A	J. W. Bowen	L. H. Seigler
Medina, A	J. R. Kennon	Fannie E. Thomson
Miamisburg, A	W. T. Trump	Hardy Jackson
Middletown, A	Arthur Powell	Geo. C. Stahl
Montpelier, R	T. G. Paseo	F. W. Leist
Mt. Gilead, R	C. B. Stoner	F. J. Ryan
Mt. Sterling, R		Cathryn Webber
Mt. Vernon, A	J. S. Alan	R. E. Offenbauer
Napoleon, A	P. C. Zemer	F. W. Leist
Nelsonville, A	Aaron Grady	O. C. Jackson
Newark, A	J. D. Simkins	F. Otto Williams
New Bremen, R	C. F. Limbach	J. O. Erwin
New Lexington, R	J. M. Gordon	G. A. Elliott
New London, A	W. H. Mitchell	Stella M. Townsend
New Lyme Institute, A		H. C. White
New Philadelphia, A	G. C. Maurer	G. A. Wyly
New Richmond, R		
New Vienna, R	W. C. Hutchinson	
Niles, R	F. J. Roller	W. H. C. Newington
North Baltimore, R	B. O. Martin	S. L. Eby
Norwalk, R	A. D. Beechy	James E. Cole
Norwood, A	W. S. Cadman	W. W. McIntire
Oak Harbor, R	H. H. Hoffman	(Mrs.) Sarah R. Gill
Oberlin, A	Ward Nye	
Oberlin Academy, A		J. F. Peck
Ohio Military Institute, R	A. M. Henshaw	S. P. C. Roberts
Orrville, R		
Osborne, R	A. F. Darby	
Ottawa, R	G. J. Keinath	L. F. Gehres

School	Superintendent	Principal
Oxford Coll. Acad., R	Jane Sherzer	Catherine Cox
Painesville, A	F. H. Kendall	A. H. Mabley
Pandora (Riley Township), R	C. D. Steiner	
Pataskala, R	E. E. Atwell	J. C. Evans
Perrysburg, R	C. E. Stinebaugh	Olive Woodard
Piqua, A	J. R. Beachler	F. E. C. Kirkendall
Plain City, R	J. S. Edwards	
Pleasant Ridge, R	F. L. Simmerman	
Pomeroy, R	C. T. Coates	Dollie Hooper
Port Clinton, R	C. C. Underwood	Lillian C. Smith
Portsmouth, A	Frank Appel	
Quaker City, R	W. G. Wolfe	J. O. Eagleson
Ravenna, R	E. O. Trescott	W. J. Dodge
Reynoldsburg, R	Arthur L. Gantz	Wm. S. Coy
Richwood, R	R. H. Allison	W. E. Shrader
Ripley, R	R. B. Smith	John W. Thalman
Sabina, R	M. J. Flannery	T. C. Madden
Salem, A	J. S. Johnson	B. F. Stanton
Salineville, R	Frank Linton	W. H. Hannum
Sandusky, A	H. B. Williams	Geo. C. Dietrich
Shelby, A	S. H. Maharry	D. J. Schaeffer
Sidney, A	Herbert R. McVay	Lee R. Dollinger
Solon, R	A. B. Horst	Charlotte Parker
Somerset, R	J. W. Davis	E. R. Beck
South Charleston, R		Stanley Zemer
Spencerville, R	Thos. J. Class	E. S. Bolton
Springfield, R	Carey Bogess	C. C. Patterson
Steubenville, A	R. L. Ervin	J. Vernon Cox
St. Mary's, A	C. C. McBroom	J. Howard Spohn
St. Paris, R	James H. Fortney	Florence Hunter
St. Raphael's Sc'l A, Tiffin, A	C. A. Krout	Sister Rosetta
Tippecanoe City, R	Orville Crist	H. H. Frazier
Toledo, A	Chas. L. Van Cleve	E. R. Rike
Troy, A	C. W. Cookson	Wm. B. Guitteau
Uhrichsville, R	L. E. Everett	Edward M. Traber
Union City (Ind.), A	O. H. Blossom	C. W. Jackson
Urbana, A	I. N. Keyser	H. N. Morton
Urbana Univ., A	Frank A. Gustafason	Russell Eaton
Ursuline Acad. (Brown Co.), R		Sister M. Baptista
Upper Sandusky, R	R. J. Kiefer	Glenn E. True
Utica, R	F. P. Householder	
Van Wert, A	J. P. Sharkey	Orrin Bowland
Wadsworth, R		W. A. Franks
Wapakoneta, A	Charles Hauptert	Mary O. Conrath
Warren, A	C. E. Carey	F. E. Ostrander
Washington C H., A	James T. Tuttle	
Wauseon, A	C. J. Biery	
Waverly, R	J. F. Henderson	G. W. Caldwell

School	Superintendent	Principal
Wellington, A	R. H. Kinnison	Elizabeth Day
Wellston, A	E. S. McCall	J. W. Whiteside
Wellsville, A	J. L. MacDonald	Ruby C. Mason
West Alexandria, R	L. D. Brouse	Clara Smith
Westerville, R	J. P. West	J. F. Nave
West Jefferson, R	L. C. Dick	
West Milton, R	F. B. Harris	Mary E. Thomas
West Unity, R	W. A. Salter	Adah Weiser
Willoughby, A	S. D. Shankland	Edward M. Ottis
Wilmington, R	E. P. West	F. P. Blair
Woodsfield, R	C. S. McVey	H. O. Young
Wooster, A	D. L. Thompson	Laura B. Kean
Worthington, R	Harvey S. Gruver	J. J. McDonald
Wyoming, A	C. S. Fay	Evelyn M. Prichard
Xenia, A	Edwin B. Cox	Geo. J. Graham
Youngstown, A	N. H. Chaney	Wells L. Griswold
Zanesville, A	W. D. Lash	Ira C. Painter

A large number of schools of other States are on the accredited list of the University and applicants presenting certificates from schools outside of Ohio must see that the certificates furnish the details of work done in accordance with the regulations prescribed on page 10.

The Ohio State University Bulletin is issued fifteen times during the Academic year; monthly in October, November, and June, and bi-weekly in December, January, February, March, April, and May.

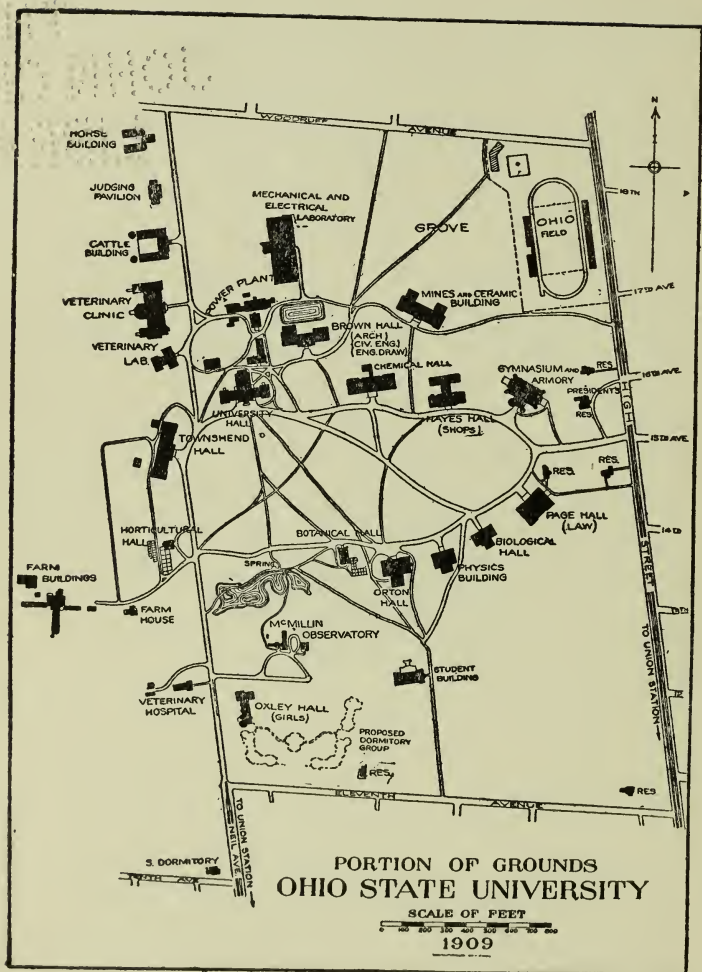
Ohio State University Bulletin

College of Agriculture and Domestic Science



January 28, 1909

PUBLISHED BY THE UNIVERSITY AT COLUMBUS
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at Columbus, Ohio, under Act of Congress, July 16, 1894.



OHIO STATE UNIVERSITY

The Ohio State University, located in Columbus, two miles north of the Union Station, is a part of the public educational facilities maintained by the State. It comprises seven colleges:

The College of Agriculture and Domestic Science,
The College of Arts, Philosophy, and Science,
The College of Education,
The College of Engineering,
The College of Law,
The College of Pharmacy,
The College of Veterinary Medicine.

This bulletin of announcements is devoted exclusively to the work of the College of Agriculture and Domestic Science.

(NOTE.—In requesting any of the announcement bulletins of the University, address the University Editor, Ohio State University, Columbus, Ohio.)

UNIVERSITY CALENDAR

1909

Entrance examinations, (8 a. m.) Tuesday to Saturday,
June 15 to 19.

Summer term, June 21 to August 13.

Entrance examinations, (8 a. m.) Tuesday to Saturday,
September 14 to 18.

First term begins—Registration Day—Tuesday, September 21.

President's Annual Address, (11 a. m.) Friday, September 24.

Latest date of admission to candidacy for a degree at the
Commencement of June, 1910, Friday, October 1.

Thanksgiving recess, November 25, 26, and 27.

Latest date for filing thesis subject, Wednesday, December 15.

First term ends Wednesday, December 22.

CHRISTMAS VACATION

1910

Second term begins—Registration Day—Tuesday, January 4.

Washington's Birthday, Tuesday, February 22.

Second term ends, Friday, April 1.

SPRING RECESS

Third term begins—Registration Day—Wednesday, April 6.
Field Day—Athletic Association—Saturday, May 7.

Competitive Drill—Cadet Regiment—Saturday, May 21.

Final examinations, Friday to Thursday, June 10 to 16.

Latest date for presenting thesis, Saturday, June 11.

Entrance examinations, (8 a. m.) Tuesday to Saturday,
June 14 to 18.

Latest date for filing bound copy of thesis, Friday, June 17.

Commencement, Wednesday, June 22.

COLLEGE OF AGRICULTURE AND DOMESTIC SCIENCE

The College of Agriculture and Domestic Science offers eight distinct courses of study :

1. A four-year course in Agriculture.
2. A four-year course in Horticulture.
3. A four-year course in Forestry.
4. A two-year course in Agriculture.
5. A two-year course in Horticulture.
6. A special course in Dairying.
7. A ten-weeks winter course in Agriculture.
8. A four-year course in Domestic Science.

The four-year courses of this College are regular collegiate courses of the University and lead to the degrees of Bachelor of Science in Agriculture, Bachelor of Science in Horticulture, Bachelor of Science in Forestry, and Bachelor of Science in Domestic Science. The requirements for admission to these courses are given in the following pages.

The short courses are for students who are not so well prepared and are unable to spend four years in the University. It has been found that one year of the short course often prepares a student for the four-year course, and that a large proportion of those who enter the short courses find time and means to continue one of the four-year courses.

FACULTY AND INSTRUCTORS

WILLIAM OXLEY THOMPSON, D. D., LL. D., PRESIDENT of the University.

HOMER CHARLES PRICE, M. S. A., DEAN, Professor of Rural Economics and Manager of University Farm.

ALFRED VIVIAN, Ph. G., SECRETARY, Professor of Agricultural Chemistry.

WILLIAM RANE LAZENBY, M. Agr., Professor of Forestry.
HENRY ADAM WEBER, Ph. D., Professor of Agricultural
Chemistry.

*GEORGE WELLS KNIGHT, Ph. D., Professor of American
History and Political Science.

ALBERT MARTIN BLEILE, M. D., Professor of Anatomy
and Physiology.

JOSEPH VILLIERS DENNEY, B. A., Professor of English.

WILLIAM MCPHERSON, Ph. D., Professor of Chemistry.

DAVID STUART WHITE, D. V. M., Professor of Veterinary
Medicine.

HERBERT OSBORN, M. Sc., Professor of Zoology and Entomology.

FRANK EDWIN SANBORN, S. B., Professor of Industrial
Arts.

JOHN ADAMS BOWNOCKER, D. Sc., Professor of Inorganic
Geology.

CHARLES SUMNER PLUMB, B. Sc., Professor of Animal
Husbandry.

SEPTIMUS SISSON, B. Sc., V. S., Professor of Comparative
Anatomy.

CHARLES BRADFIELD MORREY, B. A., M. D., Professor of
Bacteriology.

JAMES EDWARD HAGERTY, Ph. D., Professor of Economics
and Sociology.

THOMAS EWING FRENCH, M. E., Professor of Engineering
Drawing.

ARTHUR GILLETT MCCALL, B. Sc. (Agr.), Professor of
Agronomy.

OSCAR ERF, B. Sc. (Agr), Professor of Dairying.

* Absent on leave 1908-1909.

FREDERICK RUPERT MARSHALL, B. S. A., Professor of Animal Husbandry.

RUTH AIMEE WARDALL, M. A., Professor of Domestic Science.

CHARLES A. BRUCE, B. A., Professor of the Romance Languages and Literatures.

FRANCIS LEROY LANDACRE, B. A., Professor of Zoology and Entomology.

JOHN H. SCHAFFNER, M. A., M. S., Associate Professor of Botany.

JAMES STEWART HINE, B. Sc., Associate Professor of Zoology and Entomology.

V. M. SHOESMITH, B. Sc., Associate Professor of Agronomy.

EDGAR S. INGRAHAM, Ph. D., Associate Professor of Romance Languages and Literatures.

CHARLES LINCOLN ARNOLD, M. Sc., Associate Professor of Mathematics.

ANNA K. FLINT, B. S., Associate Professor of Domestic Science.

EDNA N. WHITE, B. A., Associate Professor of Domestic Art.

VERNON HAYES DAVIS, M. S. A., Assistant Professor of Horticulture.

ROBERT F. EARHART, Ph. D., Assistant Professor of Physics.

JOHN B. PRESTON, M. A., Assistant Professor of Mathematics.

GRACE M. BAREIS, B. A., Assistant Professor of Mathematics.

MAY THOMAS, Ph. D., Assistant Professor of the Germanic Languages and Literatures.

ALFRED DACHNOWSKI, Ph. D., Assistant Professor of Botany.

JOSEPH NELSON BRADFORD, M. E., Professor of Architecture.

BENJAMIN L. BOWEN, Ph. D., Professor of Romance Languages and Literatures.

HENRY R. SPENCER, Ph. D., Professor of American History and Political Science.

MATTHEW B. HAMMOND, Ph. D., Professor of Economics and Sociology.

DAVID R. MAJOR, Ph. D., Professor of Psychology.

GEORGE H. MCKNIGHT, Ph. D., Professor of English.

GEORGE L. CONVERSE, Captain U. S. A., Professor of Military Science and Tactics.

OLIVE JONES, B. A., Librarian.

H. S. WINGERT, M. D., Director of Physical Education.

NORMA L. SEARING, B. P. E., Associate Director of Physical Education for Women.

A. B. GRAHAM, Superintendent of Agricultural Extension.

BERTHOLD AUGUST EISENLOHR, B. Ph., Associate Professor of the Germanic Languages and Literatures.

WILLIAM LUCIUS GRAVES, M. A., Associate Professor of English.

WILLIAM LLOYD EVANS, Ph. D., Associate Professor of Chemistry.

EUGENE F. McCAMPBELL, B. Sc., Associate Professor of Bacteriology.

MARY R. LAVER, Associate Professor of Art.

CARSON SAMUEL DUNCAN, M. A., Assistant Professor of English.

GEORGE DAVID HUBBARD, Ph. D., Assistant Professor of Geology.

THOMAS K. LEWIS, B. Sc., Assistant Professor of Engineering Drawing.

EDWIN P. TANNER, Ph. D., Assistant Professor of American History and Political Science.

ROBERT F. GRIGGS, M. A., Assistant Professor of Botany.

HARRY CLIFFORD RAMSOWER, B. Sc. (Agr.), Assistant Professor of Agronomy.

OLIVER C. LOCKHART, M. A., Assistant Professor of Economics and Sociology.

ROBERT MEIKLEJOHN, M. E., Assistant Professor of Engineering Drawing.

RALPH ROGERS, B. S. in M. E., Assistant Professor of Engineering Drawing.

JULIA TITSWORTH, Assistant Professor of Art.

J. WARREN SMITH, M. Sc., Lecturer in Meteorology.

C. M. BEEM, Instructor in Pattern Making and Founding.

CHARLES P. CROWE, Instructor in Forging.

WILLIAM L. CLEVINGER, Instructor in Butter Making.

JOHN S. TIDBALL, B. S., Instructor in Engineering Drawing.

W. J. NORRIS, Instructor in Engineering Drawing.

F. H. HASKETT, Instructor in Architecture.

FREDERICA DETMERS, M. Sc., Instructor in Botany.

ALFRED EWINGTON, M. A., Instructor in Romance Languages.

CLARENCE A. DYKSTRA, B. A., Instructor in American History and Political Science.

A. B. NYSTROM, B. Sc. (Agr.), Instructor in Dairy Mechanics.

FIRMAN E. BEAR, B. Sc. (Agr.), Instructor in Agricultural Chemistry.

R. H. WILLIAMS, M. S., Instructor in Animal Husbandry.

LELAND D. DORNEY, B. A., Instructor in Economics and Sociology.

WILLIAM C. MORSE, M. A., Instructor in Geology.

SARAH T. BARROWS, M. L., Instructor in German.

ROBERT C. BUSEY, M. A., Instructor in German.

VITTORIO FALORSI, D. L., Instructor in Romance Languages.

IVAN STEINER, B. Sc. (Agr.), Assistant in Milk Supply.

HENRY H. P. SEVERIN, M. A., Assistant in Zoology and Entomology.

REGINALD C. COLLISON, B. S. (Agr.), Assistant in Agricultural Chemistry.

R. L. SHIELDS, B. S. (Agr.), Assistant in Agricultural Extension.

STANLEY E. COLLISON, B. S. (Agr.), Fellow in Agricultural Chemistry.

HOMER C. THOMPSON, Student Assistant in Horticulture.

JOHN CHISHOLM, Superintendent of the University Farm.

ADMISSION

Applicants for admission must be at least sixteen years of age. The College is open on equal terms to both sexes.

UNIVERSITY ENTRANCE BOARD

The admission of students is in charge of the University Entrance Board, which determines the credits which shall be issued on all entrance examinations and certificates, and furnishes all desired information to applicants. Correspondence relating to admission should be addressed to the Entrance Board, Ohio State University, Columbus.

ADMISSION TO THE COURSE LEADING TO A DEGREE

There are two modes of admission to the course leading to a degree: (a) by certificate, (b) by examination.

ADMISSION BY CERTIFICATE

Applicants may be admitted to the four-year course in Agriculture and to the four-year courses in Horticulture and Forestry* without examination on presentation of properly endorsed certificates from any first or second grade high school in this state, or from approved normal schools or from the State Board of School Examiners or from any school outside of the state which is recognized by the University, under the following provisions:

(a) If from secondary schools, the certificate must show that the applicant is a graduate in good standing of the school issuing it; and also must state in detail the studies pursued, the text-books used, the amount of work

*It is the intention of the University to have all the first and second grade high schools in the state inspected as rapidly as possible, with the idea of preparing a list of schools recognized for these courses. For the present, however, all first and second grade schools will be recognized for the courses in Agriculture, Horticulture, and Forestry.

done in each study, the amount of time devoted to it, and the fact that the applicant has passed in the work.

(b) Any entrance requirement not covered by a certificate must be met by examination.

Blank certificates may be obtained by addressing the Secretary of the Entrance Board. Certificates should be filled out and returned to the University as early as possible after the close of schools in June. Since errors are frequently made in transcribing the record upon the blank form, the candidate should verify his certificate and see that it gives him credit for all his school work.

Applicants to be admitted to the course in Domestic Science without examination, must present properly endorsed certificates from such secondary schools as have been accredited* or recognized by the University or from approved normal schools or from the State Board of School Examiners, subject to the provisions above stated.

ADMISSION BY EXAMINATION

The Entrance Board will conduct entrance examinations June 15 to 19 and September 14 to 18, 1909. A part of the examinations may be taken in June and the remainder in September. All applicants for admission who can not conform to the requirements for admission by certificate must take examinations for admission.

SCHEDULE.—Examinations will be from 8 to 12 a. m. and from 1 to 5 p. m.

Tuesday	a. m.	History: Greek and Roman, English, General.
"	p. m.	Composition and Rhetoric, Classics, Chemistry, Geology.
Wednesday	a. m.	Algebra, German, English Grammar, Descriptive Geography.
"	p. m.	Plane Geometry, Physical Geography, Arithmetic.
Thursday	a. m.	Civics, Solid Geometry, Zoology.
"	p. m.	Beginning Latin, Caesar, Astronomy, Elements of Agriculture.
Friday	a. m.	Physics, Physiology, Botany.
"	p. m.	U. S. History, French, English Literature.
Saturday	a. m.	Vergil, Cicero.

REQUIREMENTS BY UNITS

A unit is the equivalent of a course of study covering a school year of not less than thirty-two weeks with four or five periods a week. To obtain full standing applicants under twenty-one years of age must have credit by examination or certificate for twelve units (and in the course of Domestic Science fifteen units) of which two shall be English, one History, two Mathematics, one Physics, and two foreign language, selected from the following list:

English 3 units
(Foreign students may substitute their native language for the English requirement.)

American History or American History and
Civil Government 1 unit
Ancient History (Greek and Roman) and Medi-
eval History to 814 A. D. 1 unit
Medieval and Modern History (from 814 A. D.
to the present 1 unit
(For the present General History may be
counted as a unit, but not in addition to
Ancient or Medieval and Modern History.)

English History 1 unit

Algebra (through quadratics) 1 unit
Algebra (beyond quadratics) $\frac{1}{2}$ unit
Geometry (plane) 1 unit
Geometry (solid) $\frac{1}{2}$ unit
Trigonometry $\frac{1}{2}$ unit

Latin 2, 3, or 4 units
Greek 2, 3, or 4 units
German 2, 3, or 4 units
French 2, 3, or 4 units
Spanish 2, 3, or 4 units
(Not less than two units of any language will be
accepted.)

Physics 1 unit
Chemistry 1 unit
Physical Geography 1 unit

Zoology	1 unit
Botany	1 unit

Physical Geography	} For the present any two of these may be counted together as..... 1 unit
Zoology	
Botany	
Physiology	

Agriculture	} The Entrance Board may, after investigating each claim, grant a total credit of not to exceed.. 2 units
Free-hand Drawing	
Manual Training	
Domestic Science	

Preparation in excess of the requirement in any subject will not be credited unless it amounts to one-half unit. For a detailed statement of the extent and character of the work required in each subject mentioned above, persons interested should consult a special bulletin, which will be mailed to any address upon request to the University Editor.

No student under twenty-one years of age will be admitted to College if he is conditioned in more than two units. All entrance conditions must be removed within two years after admission.

Students over twenty-one years of age, after obtaining credit for elementary or "grade" work, and for such other subjects as may be necessary to qualify them for the classes that they wish to enter, may, on the presentation of satisfactory reasons, be admitted by the joint action of the Entrance Board and the Executive Committee of the College, to any class in the College, provided that if any student who has been admitted on these conditions afterwards becomes a candidate for a degree, he shall take the omitted entrance examinations at least one academic year before the degree is conferred.

ADMISSION WITH ADVANCED STANDING

Applicants who have completed at least one year's work in an approved college, and who bring official and explicit certificates describing their courses of study and scholarship, and letters of honorable dismissal, will be admitted in accordance with either of two plans:

(1) The entrance units on which the candidate was admitted to the approved college will be accepted at their

face value; deficiencies will be made up from the college credits presented, and advanced credit will be given for any remaining, satisfactory work; or

(2) One year's work will be accepted in lieu of entrance units and the candidate will be admitted without examination and without conditions, but without any advanced standing on the year's work.

Applicants who have completed less than one year's work in an approved college will be given credit for satisfactory work provided they can meet the regular entrance requirements.

REQUIREMENTS FOR SHORT COURSES

No examinations will be required for the two-year courses in Agriculture or Horticulture, but the applicant must be at least seventeen years of age and must satisfy the Entrance Board that he has had practical experience in agriculture or horticulture.

GRADUATE STUDY

Graduates of this College or of other institutions of approved standing may take graduate work in any of the departments of this College. Such students shall elect a major and minor subject and submit to the Graduate Committee of this College an outline of their course of study with the approval of the heads of the departments in which the work is to be taken. Upon the completion of one year's residence, which is devoted wholly to the completion of the course of study approved by the Graduate Committee, and the presentation of an acceptable thesis upon some subject connected with the major elective, the degree of Master of Science in Agriculture will be conferred.

COURSES OF STUDY

AGRICULTURE

The course in Agriculture is one of a number of regular four-year collegiate courses in the University. It is designed not only to make specially trained agriculturists, but also educated men. The course pre-supposes that a young man has had a High School training, or its equivalent, and that he has had the training in farm matters that usually comes to a young man who has lived on a farm. It supplements this training but does not repeat it. The technical training in this course consists of those matters which years of experience in teaching have shown are either lacking or most necessary. Young men from the cities are entering this course, as they should do if they expect to engage in agricultural pursuits, but it should be understood that the course in Agriculture does not, except incidentally, supply that training in farm matters which comes from actual life upon the farm. Such a course could be readily planned, but it would waste the valuable time of nine-tenths of the students who now enter the course.

The officers of the College recognize the danger of a too special or technical training of under-graduate students in a subject having such a wide scope and one requiring for its successful prosecution such breadth of knowledge as Agriculture. A careful examination of the course as outlined will show that about one-third of the time of the student during the four years is, or may be, devoted to language (English and foreign), history, and economics, about one-third to pure science, and one-third to technical or professional training. Electives in the junior and senior years allow the student, if he chooses, to specialize in animal husbandry, agronomy, dairying, rural economics, agricultural chemistry, bacteriology, botany, or entomology.

No man or woman is well educated until he or she has been taught both to do and to think. Both faculties are

necessary and each assists the other. Experience and reason, however, show that the students who enter the courses in agriculture have been better trained in doing than in thinking. With them manual training is not as necessary as an educational factor as with students from the cities. However, special emphasis is laid on training the faculties of observation, reason, and judgment. The laboratory methods and facilities are most thorough and complete in all scientific and technical courses, giving a training which is impossible to obtain merely from books.

COURSE IN AGRICULTURE

Degree—Bachelor of Science in Agriculture.

NOTE.—The figure in parenthesis following the name of each subject indicates the number of that subject in its department, the other figure the number of credit hours. For full description of the courses, see corresponding numbers under the departments of instruction.

FIRST YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Chemistry (7 or 44) Inorganic.	4. Chemistry (7 or 44) Inorganic.	4. Chemistry (12) Qualitative.	4.
		Chemistry (42) Organic.	2.
Zoology (1) Invertebrate.	3. Zoology (1) Invertebrate.	3. Zoology (1) Vertebrate.	3.
English (1) Paragraph Writing.	2. English (2) Expository Writing.	2. English (3) Brief Making.	2.
An.Husbandry (23) Cattle and Sheep.	4. An.Husbandry (24) Horses and Swine.	4. An.Husbandry (4) Breeds of Live Stock.	4.
Drawing (10)	3. Shopwork (2)	3. Shopwork (1)	3.
Cadet Service	1. Cadet Service	1. Cadet Service	1.
Gymnasium	1. Gymnasium	1. Gymnasium	1.

SECOND YEAR.

FIRST TERM	SECOND TERM	THIRD TERM	
Agronomy (2) Farm Equipment.	4. An. Husbandry (6) Principles of Breeding.	4. Agronomy (22) Crops.	4.
Agr. Chem. (13)	5. Agr. Chem. (13)	5. Agr. Chem. (13)	5.
Botany (6)	4. Botany (7)	4. Botany (8)	4.
Physiology (1)	3. Physiology (1)	3. Physiology (1)	3.
Zoology (4) Entomology.	3. Zoology (4) Entomology.	3. Zoology (4) Entomology.	3.
Cadet Service	1. Cadet Service	1. Cadet Service	1.

THIRD YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Geology (2) General.	5. Geology (5) Applied.	4. Agronomy (12) Soils.	4.
Dairying (12)	4. Horticulture (6)	4. Horticulture (3)	4.
Modern Language French, German, or Spanish.	4. Modern Language French, German, or Spanish.	4. Modern Language French, German, or Spanish.	4.
	Meteorology (1)	2.	

And one of the following:

An. Husbandry (2) Breeds of Live Stock.	4. An. Husbandry (8) Feeding.	4. An. Husbandry (26) Dairy Cattle.	4.
Vet. Medicine (28)	4. Vet. Medicine (29)	4. Vet. Medicine (30)	4.
Horticulture (11)	4. Dairying (24)	4. Dairying (26)	4.
Zoology (9) Entomology.	4. Zoology (10) Entomology.	4. Zoology (11) Entomology.	4.
Bacteriology (5)	4. Bacteriology (8 or 9)	4. Bacteriology (8 or 9)	4.
Agr. Chemistry (*)	4. Agr. Chemistry (*)	4. Agr. Chemistry (*)	4.
Botany (*)	4. Botany (*)	4. Botany (*)	4.

FOURTH YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Am. History (1) or Economics (33)	Am. History (1) or Economics (33)	Am. History (1) or Economics (33)	3.
Rural Econom. (2) Farm Management.	4. Rural Econom. (4) History of Agriculture.	4. Rural Econom. (6) Agricultural Economics.	4.

ELECTIVE

Ten hours a week throughout the year from any of the courses given in any of the colleges of the University upon which the student is qualified to enter, except the College of Law. Two hours a week of this elective work may be devoted to a thesis, subject to the consent of the instructor under whom the thesis is to be written.

*Students electing Agricultural Chemistry or Botany in their junior year should consult the department interested regarding the same before being registered.

HORTICULTURE

This course was established to meet a growing demand for special education and training in the College of Agriculture. It seeks to familiarize the student with those sciences

that are fundamental in Horticulture and to give a certain amount of technical and literary training.

Among the sciences that form the natural basis of a sound, practical knowledge of Horticulture are chemistry, physics, botany, geology, zoology, and entomology. To these a large part of the first two years of the course is devoted. In addition, one modern language, rhetoric or English composition, drawing and shopwork are required.

The last two years of the course are devoted mainly to Horticulture proper, with some more strictly cultural studies like history or economics. A third part of the required work of the fourth year is elective, and may be chosen from any course in the University upon which the student is qualified to enter.

The primary object of the course is to teach those who desire to become fruit-growers, gardeners, nurserymen, florists, or landscape gardeners, what they most need to know as a foundation for their professional work. To this end both the science and art, or the theory and practice, are taught. While the sciences are invaluable in giving accurate and definite knowledge regarding the origin and growth of plants, and the composition and physical properties of the soil, they cannot tell us just how to select varieties, or how to propagate, transplant, cultivate, fertilize, prune, spray, or what is equally essential in practice, how to harvest, store and market the product to the best advantage.

For earnest, enterprising young men and women, Horticulture, in its various branches, offers as large a reward for intelligent, well-directed effort as any other pursuit or profession.

COURSE IN HORTICULTURE

Degree—Bachelor of Science in Horticulture.

NOTE.—The figure in parenthesis following the name of each subject indicates the number of that subject in its department; the

other figure the number of credit hours. For full description of courses, see corresponding number under the departments of instruction.

FIRST YEAR.

FIRST TERM	SECOND TERM	THIRD TERM	
Chemistry (7 or 44) Inorganic.	4. Chemistry (7 or 44) Inorganic.	4. Chemistry (12) Qualitative.	4.
		Chemistry (42) Organic.	2.
Zoology (1) Invertebrate.	3. Zoology (1) Invertebrate.	3. Zoology (1) Vertebrate.	3.
English (1) Paragraph Writing.	2. English (2) Expository Writing.	2. English (3) Brief Making.	2.
Horticulture (21) Principles.	4. Horticulture (21) Principles.	4. Horticulture (21) Principles.	4.
Drawing (10)	3. Shopwork (2)	3. Shopwork (1)	3.
Cadet Service	1. Cadet Service	1. Cadet Service	1.
Gymnasium	1. Gymnasium	1. Gymnasium	1.

SECOND YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Horticulture (22) Pomology.	4. Horticulture (22) Pomology.	4. Horticulture (22) Pomology.	4.
Agr. Chem. (13)	5. Agr. Chem. (13)	5. Agr. Chem. (13)	5.
Physiology (1)	3. Physiology (1)	3. Physiology (1)	3.
Zoology (4) Economic.	3. Zoology (4) Economic.	3. Zoology (4) Economic.	3.
Botany (6)	4. Botany (7)	4. Botany (8)	4.
Cadet Service	1. Cadet Service	1. Cadet Service	1.

THIRD YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Horticulture (24) Olericulture.	4. Horticulture (24) Olericulture.	4. Horticulture (24) Olericulture.	4.
French (1)	French (1)	French (1)	
German (1) or	4. German (1) or	4. German (1) or	4.
Spanish (1)	Spanish (1)	Spanish (1)	
Agronomy (2) Farm Equipment.	4. Geology (5) Applied.	4. Agronomy (22) Crops.	4.
Geology (2) General.	5. Horticulture (18) Apiculture.	3. Zoology (3) Economic.	3.
		Agronomy (12)	4.

FOURTH YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Horticulture (8) Ornamental Plants.	2. Horticulture (9) or Window Gardening and Floriculture	Horticulture (10) or 2. Home Gardening.
	Horticulture (17) Plant Variation.	2. Horticulture (15) 3. Landscape Gardening.
*Horticulture (11) 5. Elements of Forestry.	*Horticulture (12) 5. Forest Technology and Timber Physics.	*Horticulture (13) 5. Forest Economics.
Am. History (1) or Political.	Am. History (1) or Political.	Am. History (1) or U. S. Political.
Economics (33) Political.	3. Economics (33) Political.	3. Economics (33) 3. Political.

ELECTIVE

Seven hours a week through the year, chosen from any of the courses given in any college of the University upon which the student is qualified to enter, except the College of Law, two hours a week of which may be devoted to thesis, subject to the approval of the department in which the thesis is to be written.

* These are courses of the Department of Horticulture and Forestry, which has been abolished. They will not be given after the year 1909-1910.

COURSE IN FORESTRY

The main objects in the establishment of a four-year course in Forestry are: (1) To educate and train young men in Forestry. (2) To promote Forestry in the State of Ohio.

The facilities for becoming well grounded in the fundamental and accessory studies are provided in the various departments of the University. Language, mathematics, chemistry, engineering, botany, entomology, etc., from a large part of the work of the first two years of the course, while the last two years are devoted to the more technical subjects.

It is the aim of the department to reach two classes of students: First, those who purpose to make Forestry their life work. Second, those who, while specializing in other courses, desire to acquaint themselves with the elements or with certain phases of the general subject.

To those who enjoy outdoor life, and are willing to undergo vigorous tests of mental and physical strength, Forestry presents an especially inviting field. The remuneration compares favorably with that of other salaried professions, and the opportunities for private enterprise are wide and varied.

To promote Forestry, or the proper use, improvement, and extension of woodlands and forests, the department will do all in its power to bring the subject before the people of the State, and will co-operate with all agencies working to this end.

OUTLINE OF FOUR-YEAR COURSE IN FORESTRY

Degree—Bachelor of Science in Forestry.

NOTE.—The figure in parenthesis following the name of each subject indicates the number of that subject in its department; the other figure the number of credit hours. For full description of courses, see corresponding number under the departments of instruction.

FIRST YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Chemistry (7 or 44)	4. Chemistry (7 or 44)	4. Chemistry (12)	4.
Mathematics (31)	5. Mathematics (32)	5. Chemistry (42)	2.
French (1)	French (1)	French (1)	
German (1) or	4. German (1) or	4. German (1) or	4.
Spanish (1)	Spanish (1)	Spanish (1)	
English (1)	2. English (2)	2. English (3)	2.
Eng. Drawing (1)	2. Eng. Drawing (2)	2. Forestry (2)	2.
Forestry (1)	1.	Elementary.	
Elementary.		Botany (9)	2.
Cadet Service	1. Cadet Service	Dendrology.	
Gymnasium	1. Gymnasium	1. Cadet Service	1.
		Gymnasium	1.

SECOND YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Botany (6)	4. Botany (7)	4. Botany (8)	4.
Zoology (4)	3. Zoology (4)	3. Zoology (4)	3.
Entomology.	Entomology.	Entomology.	
French (2)	French (2)	French (2)	
German (4) or	4. German (4) or	4. German (4) or	4.
Spanish (2)	Spanish (2)	Spanish (2)	
Civil Eng. (30)	5. Civil Eng. (4)	4. Forestry (3)	4.
Surveying.	Top. Draw.	Arboriculture.	
Cadet Service	1. Cadet Service	1. Cadet Service	1.

THIRD YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Forestry (4)	3. Forestry (5)	3. Forestry (6)	3.
Silviculture.	Silviculture.	Silviculture.	
Botany (17)	4. Botany (17)	4. Botany (17)	4.
Geology (2)	5. Geology (5)	4. Agronomy (12)	4.

Not less than five hours throughout the year from the following :

Physics (11)	3. Physics (11)	3. Physics (11)	3.
Agr. Chem. (13)	5. Agr. Chem. (13)	5. Agr. Chem. (13)	5.
Bacteriology (5)	4. Bacteriology (9)	4. Bacteriology (9)	4.
Zoology (9)	3. Zoology (10)	3. Zoology (11)	3.
Eng. Drawing (45)	2. Eng. Drawing (46)	2. Eng. Drawing (47)	2.
Horticulture (8)	2. Horticulture (18)	3. Horticulture (3)	4.
Economics (33)	3. Economics (33)	3. Economics (33)	3.
Agronomy (16)	3.	Horticulture (15)	3.

FOURTH YEAR.

FIRST TERM	SECOND TERM	THIRD TERM	
Forestry (7)	4. Forestry (8)	4. Forestry (9)	4.
Mensuration.	Timber Physics.	Utilization.	
Forestry (10)	4. Forestry (11)	4. Forestry (12)	4.
Management.	Economics.	Policies.	
Botany (24)	4. Botany (24)	2. Botany (24)	4.
Physiological	Physiological	Physiological	
Ecology.	Ecology.	Ecology.	

Not less than five hours throughout the year from any course upon which the student is qualified to enter.

TWO-YEAR COURSE IN AGRICULTURE

The Short Course in Agriculture is a two-year course, designed to give practical instruction in the various branches of agriculture, and is intended primarily for those students whose previous training does not qualify them to enter the four-year course. While believing that the four-year course is none too long for the students who expect to engage in agricultural pursuits, it is recognized that there are many students whose circumstances make it impossible to take a four-year collegiate course in agriculture, and yet who would be greatly benefited by taking a less extended training for their life work.

This course is especially desirable for students of rather mature age. It contains as thorough instruction as the time will admit in agriculture, animal husbandry, dairying, horticulture (including fruit culture, vegetable gardening, and forestry), veterinary medicine, economic entomology, bacteriology, and the sciences underlying these subjects. The second year contains optional work so that it is possible for students to specialize in horticulture, agronomy, animal husbandry, or dairying. The second year also contains a number of elective studies which may be taken as preparatory to the first year of the four-year course in Agriculture.

No degree is given on the completion of the work, but a certificate is issued stating fully the work done.

OUTLINE OF TWO-YEAR COURSE IN AGRICULTURE

NOTE.—The figure in parenthesis following the name of each subject indicates the number of that subject in its department; the other figure the number of credit hours. For full description of courses, see corresponding number under the departments of instruction.

FIRST YEAR

FIRST TERM	SECOND TERM	THIRD TERM
An. Husbandry (1)	4. An. Husbandry (1)	4. An. Husbandry (1) 4.
Horticulture (1) Elementary.	4. Horticulture (1)	4. Horticulture (1) 4.
Drawing (10)	3. Shopwork (1)	3. Shopwork (2) 3.
Chemistry (3) Elementary.	4. Chemistry (3) Elementary.	4. Chemistry (45) or Qualitative Analysis. Agr. Chem. (16) 4. Soil Fertility.
Cadet Service	1. Cadet Service	1. Cadet Service 1.
Gymnasium	1. Gymnasium	1. Gymnasium 1.

SECOND YEAR.

FIRST TERM	SECOND TERM	THIRD TERM
Agronomy (2) Farm Equipment.	4. Agronomy (11) Soils.	4. Agronomy (22) 4. Crops.
Dairying (12) Elementary.	4. Dairying (24) Dairy Equipment.	4. Dairying (26) 4. Farm Dairying.
Cadet Service	1. Cadet Service	1. Cadet Service 1.

And two subjects each term chosen from the following:

Vet. Medicine (28) 4.	Vet. Medicine (29) 4.	Vet. Medicine (30) 4.
An. Husbandry (25) 4. Dairy Cattle.	An. Husbandry (3) 4. Stock Feeding.	An. Husbandry (5) 4. Stock Breeding.
Horticulture (19) 4. Pomology.	Horticulture (19) 4. Pomology.	Horticulture (19) 4. Pomology.
Zoology (7) Entomology.	Zoology (7) Entomology.	Zoology (7) 4. Entomology.
Physiology (2)	3. Bacteriology (2)	3. Rural Econom. (1) 4.
Mathematics (1) Algebra.	5. Mathematics (3a) Geometry.	5. Botany (1) 4. Elementary.
Physics (1)	5. Physics (1)	5. Geology (1) 5. Physical Geography.

TWO-YEAR COURSE IN HORTICULTURE

This course is intended to be to those engaged in horticultural pursuits what the two-year course in Agriculture is to those interested in farming. Practical instruction will be given in the subjects which are of interest to the fruit-growers, gardeners, nurserymen, florists, and landscape gardeners. The course is primarily for the student, who, for various reasons, cannot take the four-year course in Horticulture and yet desires to have somewhat thorough preparation in the fundamentals of horticulture.

No degree is given on completion of the work but a certificate is issued stating fully the work done.

OUTLINE OF TWO-YEAR COURSE IN HORTICULTURE

FIRST YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Horticulture (1)	4. Horticulture (1)	4. Horticulture (1)	4.
Zoology (7) Entomology.	4. Zoology (7) Entomology.	4. Zoology (7) Entomology.	4.
Drawing (10)	3. Shopwork (2)	3. Shopwork (1)	3.
Chemistry (3) Elementary.	4. Chemistry (3) Elementary.	4. Chemistry (45) or Qualitative Analysis. Agr. Chem. (16)	4.
Cadet Service	1. Cadet Service	1. Cadet Service	1.
Gymnasium	1. Gymnasium	1. Gymnasium	1.

SECOND YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Horticulture (19) Pomology.	4. Horticulture (19) Pomology.	4. Horticulture (19) Pomology.	4.
Agronomy (2) Equipment.	4. Agronomy (11) Soils.	4. Agronomy (22) Crops.	4.
Cadet Service	1. Cadet Service	1. Cadet Service	1.

Not less than seven hours from the following:

Horticulture (11)	5. Horticulture (18)	3. Horticulture (15)	3.
Elements of Forestry.	Apiculture.	Landscape Gardening.	
Horticulture (8)	2. Horticulture (2)	4. Horticulture (14)	4.
Floriculture.		Vegetable Gardening.	
Mathematics (1)	5. Mathematics (3a)	5. Rural Econom. (1)	4.
Algebra.	Geometry.	Farm Management.	
Physics (1)	5. Physics (1)	5. Geology (1)	5.
		Physical Geography.	
Physiology (2)	3. Bacteriology (2)	3. Botany (1)	5.
		Elementary.	

WINTER COURSES

WINTER COURSE IN DAIRYING—THE OHIO DAIRY SCHOOL

This course in Dairying is established to meet the wants of those who have neither the time nor means for more extended courses. It is designed especially for those who are desirous of mastering the art of butter and cheese making or who wish to become fitted for the position of manager or superintendent of a creamery or cheese factory. In this course the greater part of the time is given to the laboratory or dairy room practice. This consists in the testing of milk as to purity and content of butter fat; the use and care of centrifugal separators and other dairy devices; the making of butter and cheese by the most improved methods; in short, all the essential operations of the creamery, factory, and home dairy management are repeatedly performed under the guidance and direction of competent instructors. A special bulletin describing this course will be mailed upon application to any one interested.

WINTER COURSE IN AGRICULTURE

The ten weeks Winter Course in Agriculture has been established to meet the demands of those Ohio farmers who are unable to avail themselves of the other courses in agriculture offered by the University. There is a large number of young men located on the farms of our state who are so situated that it is impossible for them to be absent from

their homes during the nine months of the college year, but yet desire some training in the principles of agriculture. On other farms are found mature men, who are past the usual school age but are ambitious to become familiar with the most recent agricultural thought and practices.

This course offers to such men an opportunity to become familiar with the results of the latest investigation in agriculture and to study the theories resulting from his research and their practical application to work on the farm.

Those interested are invited to write for the special announcement describing this course.

DOMESTIC SCIENCE

The course in Domestic Science is planned to meet the special needs of women students. Four years of regular university work are required. The Department of Domestic Science stands for a liberal training of a university grade, which gives a homeward trend to the education of young women.

The course is essentially scientific in character, but a fair amount of literary, artistic, and economic training is provided. Certain courses offered in this department are electives for students who specialize along other lines of work. The prescribed course affords opportunity for a student to specialize in domestic science, and elective courses in addition to this provide training for those who wish to teach the subject. Students desiring to enter this course will be required to present fifteen units entrance requirements.

OUTLINE OF COURSE IN DOMESTIC SCIENCE

Degree—Bachelor of Science in Domestic Science.

NOTE.—The figure in parenthesis following the name of each subject indicates the number of that subject in its department; the other figure the number of credit hours. For full description of course see corresponding numbers under the departments of instruction.

FIRST YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Chemistry (7 or 44) Inorganic.	4. Chemistry (7 or 44) Inorganic.	4. Chemistry (12) Qualitative Analysis.	4.
Art (10)	2. Art (11)	2. Art (12)	2.
English (1) Paragraph Writing.	2. English (2) Expository Writing.	2. English (3) Brief Making.	2.
Zoology (1) Invertebrate.	3. Zoology (1) Invertebrate.	3. Zoology (1) Vertebrate.	3.
French (1) or	French (1) or	French (1) or	
German (1)	4. German (1)	4. German (1)	4.
Domestic Art (1) Hand Craft.	2. Domestic Art (2) Textiles.	2. Domestic Art (3) Textiles.	2.
Hygiene and Physical Training	1. Hygiene and Physical Training	1. Hygiene and Physical Training	1.

SECOND YEAR

FIRST TERM	SECOND TERM	THIRD TERM	
Chemistry (34) Organic.	5. Ag. Chem. (14)	5. Ag. Chem. (14)	5.
Dom. Science (1) Foods.	3. Dom. Science (2) Foods.	3. Dom. Science (3) Foods.	3.
Physiology (1)	3. Physiology (1)	3. Physiology (1)	3.
French (2) or	French (2) or	French (2) or	
German (4)	4. German (4)	4. German (4)	4.
Eng. Drawing (20)	1. Eng. Drawing (15) 1½.	1. Eng. Drawing (15) 1½.	
Hygiene and Physical Training.	1. Hygiene and Physical Training.	1. Hygiene and Physical Training.	1.

THIRD YEAR.

FIRST TERM	SECOND TERM	THIRD TERM	
Economics (33)	3. Economics (33)	3. Economics (33)	3.
Botany (13)	3. Botany (13)	3. Botany (13)	3.

ELECTIVES

Not less than nine hours throughout the year chosen from the following electives, including either Group A or B, or both.

GROUP A.

Bacteriology (5)	4. Bacteriology (7)	4. Dom. Science (10)	3.
Ag. Chem. (21)	3. Dom. Science (4)	4. Dom. Science (11)	3.

GROUP B.

Art (13)	2. Art (14)	2. Art (15)	2.
Domestic Art (4)	3. Domestic Art (5)	3. Domestic Art (8)	3.

OTHER ELECTIVES

English (8)	3. English (8)	3. English (8)	3.
Architecture (9)	3. Architecture (10)	3. Architecture (11)	3.
Psychology (1)	3. Psychology (1)	3. Psychology (1)	3.
		3. Physiology (3)	3.
		Bacteriology (7)	4.

FOURTH YEAR

FIRST TERM	SECOND TERM	THIRD TERM
Sociology (1)	3. Sociology (1)	3. Sociology (1) 3.

Not less than twelve hours, which must include either Group A or B. Both may be taken.

GROUP A

Dom. Science (13) 2-5	Dom. Science (13) 2-5	Dom. Science (13) 2-5
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GROUP B

Philosophy (115) 2. (Esthetics.)	Philosophy (115) 2. (Esthetics.)	Philosophy (115) 2. (Esthetics.)
Drawing (17) 2.	Drawing (40) 2.	Drawing (41) 2.

SUGGESTIVE ELECTIVES

Agr. Chem.(18 or 21) 3-5.	Agr. Chem.(18 or 21) 3-5.	Agr. Chem.(18 or 21) 3-5.
Amer. History (1) 3.	Amer. History (1) 3.	Amer. History (1) 3.
Dom. Science (12) 3.	Domestic Art (6) 3.	Germ. Literature 3.
Bacteriology (5) 3-5.	Bacteriology (7) 3-5.	Bacteriology (7) 3-5.
	Dom. Science (10) 3.	
	Dom. Science (4) 4.	Dom. Science (11) 3.
Art (13) 2.	Art (14) 2.	Art (15) 2.
Domestic Art (4) 3.	Domestic Art (5) 3.	Domestic Art (7) 3.
Philosophy (103) 2. Ethics.	Philosophy (103) 2. Ethics.	Philosophy (103) 2. Ethics.
Physiology 9 or 11.	Physiology 9 or 11.	Physiology 9 or 11.
Botany*	Botany*	Botany*
Bacteriology 6 or 15.	Bacteriology 6 or 15.	Bacteriology 6 or 15.
Zoology	Zoology	Zoology

DEPARTMENTS OF INSTRUCTION

AGRICULTURAL CHEMISTRY

(Townshend Hall)

PROFESSOR VIVIAN, PROFESSOR WEBER, MR. BEAR, MR. R. C. COLLISON, MR.
S. E. COLLISON.

The department of Agricultural Chemistry occupies the greater part of the second floor of Townshend Hall. The main students' laboratory is at present fitted up with one hundred and fifty desks, and will accommodate over two hundred students. Each desk contains a complete outfit of apparatus and chemicals necessary for the work in hand. Special apparatus and chemicals are supplied from the store room. Each desk is supplied with gas and water. Hoods for evaporation and generation of noxious gases and liquids are conveniently arranged on both sides and one end of the laboratory. From the main laboratory, easy access is had to the balance room and private laboratory of the instructor on one side and to the organic analysis and assistant's room and store room on the other. A room entirely detached from the main laboratory is fitted up for water analysis and for the polariscopic determination of sugar. The lecture room is capable of seating one hundred and fifty students. In connection with it is a preparation room, which is supplied with the necessary apparatus and specimens for illustrating the lectures.

13. GENERAL AGRICULTURAL CHEMISTRY. Five credit hours. Three terms. Four-year course in Agriculture, Horticulture, and Forestry. Prerequisite, Chemistry, 7, 12, and 42. *M., W., F., at 9.* Laboratory, *M., F., 1 to 4, or Tu., Th., 1 to 4.* PROFESSOR VIVIAN, MR. BEAR, MR. R. C. COLLISON, and MR. S. E. COLLISON.

Three lectures and two laboratory periods weekly. Lectures on chemistry as applied to agriculture, including the following topics: Food requirements of plants, sources of plant food, soil exhaustion and amelioration, barnyard manures and commercial fertilizers, composition of feeding stuffs and dairy products. Laboratory

work consists of a brief introduction to quantitative analysis, gravimetric and volumetric, followed by the analysis of fertilizers, feeding stuffs, and dairy products.

14. DOMESTIC SCIENCE CHEMISTRY. Five credit hours. Course in Domestic Science, second and third term. Prerequisite Chemistry, 7, 12, and 34. *W., F., at 8.* Laboratory, *M., Tu., 1 to 4, or Th., F., 1 to 4.* PROFESSOR VIVIAN, MR. BEAR, MR. R. C. COLLISON, and MR. S. E. COLLISON.

Lectures on household chemistry. Laboratory work consists of a brief introduction to quantitative analysis, followed by the analysis of foods and other materials of household interest.

15. INDUSTRIES RELATED TO AGRICULTURE. Four credit hours. Three terms. Prerequisite, Course 13, or an equivalent preparation in quantitative analysis. Time to be arranged. Professor WEBER.

Lectures on the manufacture of sugar from cane, sorghum, and beets; the manufacture of starch, glucose, and dextrine; the nature and production of fruit, malt, and distilled vinegars; the manufacture of alcohol, malt liquors, and wines. Laboratory practice consists of the analysis of sugar, syrup, and sugar-producing plants; determination of cane sugar and milk sugar by means of the polariscope; the analysis of flours and starches; analysis of vinegars and spirituous and fermented liquors.

16. APPLICATION OF CHEMISTRY TO AGRICULTURE. Four credit hours. *M., Tu., Th., F., at 11.* Short courses in Agriculture and Horticulture. Third term. Professor VIVIAN.

Lectures and recitations embrace the following topics: Ingredients of plants, organic and inorganic, essential and non-essential; sources of plant food, air and soil; nature of soil, mechanical portion, nutritive portion, assimilable and reserve plant food; soil exhaustion and amelioration; barnyard manure, its sources, composition, and preservation; commercial fertilizers, their rational use; methods of determining the needs of soils.

17. ADVANCED AGRICULTURAL ANALYSIS. Five credit hours. Three terms. Prerequisite, Course 13. Professors WEBER and VIVIAN and MR. BEAR.

The work of this course consists of a detailed study of the official methods of determining nitrogen, potash, phosphoric acid; the complete analysis of grains and feeding stuffs, milk, butter, and cheese. Intended for students desiring to specialize in agricultural chemistry.

18. **FOOD INSPECTION AND ANALYSIS.** Three to five credit hours. Three terms. Prerequisite, Course 13, or an equivalent preparation in quantitative analysis. Professors WEBER and VIVIAN.

Lectures on composition of foods and food adulteration. Laboratory practice embraces the analysis of foods, tea, coffee, syrups, spices, condiments, flavoring extracts, baking powder; sanitary analysis of water; analysis of fats and oils, etc., and the examination of the same for adulteration. This course is designed to prepare for the analytical work connected with the state control of the sale of food stuffs, etc.

19. **DAIRY CHEMISTRY.** Three to five credit hours. Three terms. Prerequisite, Course 13. Time to be arranged. Professors VIVIAN and WEBER.

Lectures on the composition of milk and its products; fermentation, digestion, and decomposition of milk. Laboratory practice on the complete analysis of milk, butter, and cheese; determination of the chemical and physical constants of butter fat; determination of the different proteids of milk and a study of their cleavage products; effect of treatment of dairy products on their chemical composition as shown by analysis, etc. Intended for students specializing in dairying and should be accompanied or preceded by a course in dairying.

20. **CHEMISTRY OF SOILS.** Three to five credit hours. Three terms. For students specializing in Agronomy. Prerequisite, Course 13. Time to be arranged. Professors WEBER and VIVIAN.

Lectures and laboratory work on the chemical composition of the soil, using the official method of analysis of soils, and the various methods suggested by the U. S. Department of Agriculture; testing needs of soils for application of commercial fertilizers.

21. **ADVANCED HOUSEHOLD CHEMISTRY.** Three to five credit hours. Three terms. Prerequisite, Course 14. First term, *Tu., Th., at 8, M., F., 9 to 12.* Second and third terms, time to be arranged. Professors WEBER and VIVIAN.

A study of the composition and analysis of foods; the chemistry of cookery and changes during cooking, as shown by analysis; the examination of cleaning materials, baking powders, the sanitary analysis of water, etc.

22. **RESEARCH WORK.** Five to ten credit hours. Three terms. Time to be arranged. Professors WEBER and VIVIAN.

23. CHEMISTRY OF ANIMAL NUTRITION. Three to five credit hours. Three terms. Prerequisites, Course 13 or equivalent. Time to be arranged. Professor VIVIAN.

For students specializing in Animal Husbandry.

(Courses 17 to 23 may be taken as graduate work if not previously elected, or continued as special lines of research during a graduate course. Major graduate work may be taken along these or other lines included in Agricultural Chemistry.)

AGRONOMY

(Townshend Hall)

PROFESSOR MCCALL, ASSOCIATE PROFESSOR SHOESMITH, ASSISTANT
PROFESSOR RAMSOWER

For the work in farm equipment and rural engineering the department is supplied with apparatus for studying the effect of grade, height of obstruction, height of hitch, size of wheel, and weight of load on the draft of wagons. Correct and incorrect methods of constructing and using the double-tree are studied by means of a large, adjustable model. The draft of vehicles and farm implements is studied by means of a self-registering dynamometer. The agricultural machinery room contains many of the latest models of farm machinery, including binders, mowers, plows, cultivators, and gasoline engines. Several drainage levels and an architect's level are provided for the student's use in running levels and laying out drainage systems. A plane table is used for mapping and laying out fields. A small cement laboratory provides facilities for studying the use of cement and concrete on the farm. A large glass house with its equipment of railroad tracks, trucks, and pots affords opportunity for the study of the adaptability of crops to soils, the fertilizer requirements of different soils and various other problems of crop production. The soils laboratory is provided with apparatus for the study of the physical properties of soils, including specific gravity, the retention of moisture, the effect of mulches on evaporation, the rate of percolation of water through soils, and the capillary rise of moisture in

soils. The laboratory is also provided with a complete centrifugal outfit for the mechanical analysis of soils, and electrical instruments for determining temperature and soluble salt content.

In the study of crops use is made of a large collection of seeds, of dried specimens of grasses, grains, and other crops, and the growing crops on the farm. For the corn judging work samples are secured of all the chief varieties grown in different sections of the corn belt, and opportunity is offered in the advanced courses to assist in judging at local corn shows. The market grades of grain and hay are studied by commercial samples secured from the chief markets of these crops. The department is supplied with Brown-Duval testers and ovens for the study of the moisture content of field crops in different stages of curing and under different processes of storage.

The variety test plots include all the principal Ohio varieties of corn, wheat, oats, barley, flax, sorghum, millet, soy beans, and cow peas, and the different species of grasses and legumes used for pastures and meadows, all grown side by side, so that a comparative study may be made as to the value of each. Breeding plots of corn, wheat, alfalfa, clover, and timothy are maintained to give opportunity for the study of variation, correlation, selection, and other principles of plant breeding as well as the practical methods of crop improvement.

2. FARM EQUIPMENT. Four credit hours. First term. Prerequisite, Eng. Drawing 10. *M., W., F., at 9 or 11; W. or F., 1 to 4; Tu. or Th., 9 to 12.* Professor McCALL, Assistant Professor RAMSOWER.

Lectures and recitations on the laying out, and equipment of the farm, the planning of farm buildings, and a general study of farm power, water supply, and farm machinery. Practicum in the laying out of farms, the planning of farm buildings, comparison of farm machines and in the working out of problems in farm mechanics.

4. AGRICULTURAL ENGINEERING. Five credit hours. Third term. Prerequisite, Agronomy 2. *Tu., Th., at 9; Tu., Th., 1 to 4.* Professor McCALL, Assistant Professor RAMSOWER.

Lectures, recitations, and practicum on (a) location of farm buildings, and works, the survey and measurement of fields and lots; (b) planning and construction of farm buildings and works, including a study of timber, brick, cement, and other building materials; (c) the laying out and construction of drainage systems.

11. ELEMENTARY SOILS. Four credit hours. Second term. Two-year courses in Agriculture and Horticulture. *M., W., F., at 11; W. or F., 1 to 4.* Professor McCALL.

Lectures and recitations on the formation and physical properties of our agricultural soils with special reference to methods of management and improvement. Practicum in the laboratory for the study of the relation of soils to air, heat, moisture, and fertilizers.

12. ELEMENTARY SOILS. Four credit hours. Four-year courses in Agriculture, Horticulture, and Forestry. Third term, *M., W., F., at 8; M., 1 to 4.* Professor McCALL.

Lectures and recitations on the origin, formation, and kinds of soils, their chemical and physical composition, and improvement by cultivation, fertilization, drainage and irrigation. Laboratory studies of the physical properties of soils, and the factors which control soil fertility.

14. ADVANCE SOILS. Five credit hours. First term. Prerequisite, Agronomy 11 or 12. *Tu., Th., at 8; Tu., Th., 1 to 4.* Professor McCALL.

Lectures and recitations upon the kinds and distributions of soils in the United States, the factors underlying their fertility, and their crop-producing power as affected by methods of cultivation and cropping. Special laboratory work will be assigned.

16. FIELD WORK IN SOILS.. Three credit hours. First term. Lecture arranged. *W., 1 to 4.* Professor McCALL.

Lectures on the general character of the more important soils of the United States, methods of establishing soil types, and the adaptability of special crops to these different soil types. Practical work in the mapping of soils in the field, the identification of the soil types, and the preparation of reports.

22. FIELD CROP PRODUCTION. Four credit hours. Third term. Prerequisite, Botany 1, or its equivalent. *M., W., F., at 11; W. or F., 1 to 4; Tu. or Th., 9 to 12.* Associate Professor SHOESMITH.

A study of the history, adaptation, distribution, and classification of the cereal crops, and the cultivation, harvesting, and marketing of the same throughout the great agricultural sections of the world, with special attention given to Ohio conditions.

23. SEED AND MARKET GRAIN. First term. Two credit hours. Time to be arranged. Practicum. Prerequisite, Agronomy 22. Associate Professor SHOESMITH.

Seed selection, corn, and small grain judging, and the market grading of grains.

27. GRASSES AND FORAGE CROPS. Three credit hours. First term. Prerequisite, Botany, 1, or its equivalent. *Tu., Th., at 9*. Laboratory to be arranged. Associate Professor SHOESMITH.

The study of the history, distribution, adaptation, characteristics, cultivation, harvesting and marketing of the principal forage crops, including the grasses and legumes used for pastures and meadows, annual forage crops, soiling, and silo crops. Laboratory work in the study of methods and preparing the seed-bed, root systems of forage plants, root nodules and inoculation of legumes, moisture content of forage crops, comparison of silage methods, comparative study of annual forage crops, and seed testing for purity and germination.

24. AGRICULTURAL EXPERIMENTATION. Four credit hours. Second term. Lecture arranged. *Tu., Th., 1 to 4*. Professor MCCALL.

Lectures upon history and development of experiment stations, methods, and character of station work, and the interpretation of experimental results. Seminars devoted to the study of experiment station literature, and to the methods of experimentation.

26. FIELD CROP IMPROVEMENT. Three credit hours. Third term. Prerequisite, Agronomy 22. *Tu., Th., at 8; W., 1 to 4*. Associate Professor SHOESMITH.

A study of the principles involved and the methods used in the improvement of field crops.

GRADUATE WORK

Special work in Soils, or Crops, will be arranged for students desiring to take a graduate course in Agronomy.

28. ADVANCED CROP PRODUCTION. Five to ten credit hours. Three terms.

Research and monograph work in one or more of the cereal or forage crops.

29. ADVANCED CROP IMPROVEMENT. Five to ten credit hours. Three terms.

Research work in plant breeding, the study of plant breeding experiments at the University and at the State Experiment Station, and the investigation of crop improvement work in other states and countries.

30. RESEARCH WORK IN SOILS. Three to five credit hours. Three terms.

The preparation of monographs and special laboratory or field work on topic connected with the physical properties of soils.

AMERICAN HISTORY AND POLITICAL SCIENCE.

(University Hall, Rooms 205 and 410.)

PROFESSOR KNIGHT, PROFESSOR SPENCER, ASSISTANT PROFESSOR TANNER,
MR. DYKSTRA, AMERICAN HISTORY.

1. POLITICAL HISTORY OF THE UNITED STATES. Three credit hours. Three terms. Thwaite's *The Colonies*; Hart's *Formation of the Union*; Wilson's *Division and Re-union*. *M., W., F.*, 8, 9, or 1. Assistant Professor TANNER, MR. DYKSTRA.

A general course in the political history from the earliest colonial times to the present. Text-books, prescribed readings, and topical reports.

ANATOMY AND PHYSIOLOGY.

(Biological Hall, Rooms 12 and 20.)

PROFESSOR BLEILE, ASSISTANT PROFESSOR SEYMOUR, MR. FEIEL.

The facilities provided for the study of anatomy, histology, and physiology are good. The laboratory is supplied with skeletons, manikin, and many models of the organs of the body. The apparatus for work in physiology is of good construction and adequate for the performance of fundamental physiological experiments.

For work in histology the equipment includes fifty individual tables for student work, each one being supplied with a good microscope and the various accessories. The equipment of the laboratories makes it possible to offer work along certain lines to advanced students.

1. HUMAN ANATOMY AND PHYSIOLOGY. Three credit hours. Three terms. This course must be preceded or accompanied by a course in chemistry. *Sec. I, M., W., F., at 8.* Assistant Professor SEYMOUR. *Sec. II., M., W., F., at 9.* Professor BLEILE.

2. GENERAL PHYSIOLOGY. Three credit hours. First term. Short course in Agriculture. *M., W., F., at 9.*

3. CHEMICAL PHYSIOLOGY. Three credit hours. Course in Domestic Science, third term. *Th., F., 1 to 4.* Professor BLEILE.

ANIMAL HUSBANDRY

(Townshend Hall.)

PROFESSOR PLUMB, PROFESSOR MARSHALL, MR. WILLIAMS

Various methods are made use of in educational work in Animal Husbandry. The University herd contains a large number of very high class, valuable animals. These include excellent specimens for class room work of pure bred Short-horn, Aberdeen Angus, Galloway, Jersey, Guernsey, Holstein-Friesian, and Red Polled cattle, and a variety of grade and pure bred beef steers. Good specimens of Merino, Southdown, Shropshire, and Cotswold sheep and Berkshire, Poland China, Hampshire, and large Yorkshire swine are also kept. The University owns some choice pure bred Percheron, Clydesdale, and Hackney mares, as well as several excellent grade French Coach horses. In addition to this, at convenient distances are famous studs of imported Percheron, French Coach, German Coach, and Belgian horses. Students are conducted to Columbus stables containing large numbers of horses, and to stock farms about Columbus and in neighboring counties, where methods of feeding and handling may be studied and animals inspected. Each year a class of students attends the International Live Stock Exposition at Chicago in charge of instructors, spending a few days among the stock exhibits, the Union stock yards, and packing houses. Class room facilities in animal husbandry are of a very high order. The judging pavilion

for live stock is a beautiful brick structure with a large room 112 feet long, with tan bark floor, on which stock may be shown to the very best advantage. This building, with the new cattle and horse barns, all constructed in 1907 at a cost of \$80,000, gives the University the very finest of facilities for teaching Animal Husbandry. As additional facilities for instruction, the University has a very superior collection of herd, flock, and stud books of the various American and European breeding associations, these being used in laboratory work in the Principles of Breeding. There is also a large collection of lantern slides of breeds and types of animals, various instruments for measuring and studying stock, specimens of feeding stuffs, wools, and other animal products.

FOUR-YEAR COURSE

2. TYPES AND BREEDS OF HORSES AND SHEEP. Four credit hours. First term. *M., Tu., Th., at 10; W., 1 to 4.* Professor PLUMB, Professor MARSHALL.

Lectures, text-book, and recitations, upon the history, development, characteristics, and adaptations of types and breeds of horses and sheep. Laboratory work includes judging types and breeds of horses and sheep one afternoon a week and occasional inspection trips to herds in the state.

4. TYPES AND BREEDS OF CATTLE AND SWINE. Four credit hours. Third term. *M., W., F., at 11; Tu. or Th., 1 to 4.* Professor PLUMB, Professor MARSHALL.

Covers the subjects of cattle and swine on the same basis as Course 2.

6. PRINCIPLES OF BREEDING. Four credit hours. Second term. *M., W., F., at 11; W., 1 to 4.* Professor MARSHALL.

Lectures, text-books and recitations upon the subjects of heredity from various points of view in its application to breeding farm animals. Library research is required, and for laboratory work one afternoon a week is devoted to studying pedigree construction, and working out problems in heredity from herd books.

8. FEEDING ANIMALS. Four credit hours. Second term. *M., Tu., Th., F., at 10.* Professor PLUMB.

A consideration of the laws of nutrition, the character and composition of feed stuffs and methods of feeding different kinds of farm animals under varying conditions. Work to a reasonable extent is required of students in calculating rations and in studying rations in practical use in the community and suggesting improvements if desirable. The economy of the subject is carefully considered.

10. **HYGIENE AND MANAGEMENT.** Four credit hours. Second term. *M., Tu., Th., F., at 8.* Professor MARSHALL.

A series of lectures on the sanitation of the stable, on conditions of health surrounding stock in general, and a discussion of the approved methods to be used in managing and caring for horses, cattle, sheep, and swine.

12. **ANIMAL CONFORMATION AND STOCK JUDGING.** Four credit hours. First term. *W., at 11; M., F., 1 to 4.* Professor MARSHALL.

This is an advanced class for students who have already had the work of the Junior year in courses 2 and 4. The purpose is to give a more detailed consideration to type and breed conformation, with an emphasis on practice in judging groups and classes and rendering required reasons therefor.

14. **LIVE STOCK MARKETING AND COMMERCE.** Four credit hours. Third term. *M., W., F., at 8; F., 1 to 4.* Professor PLUMB.

A discussion of the purposes and work of live stock markets, methods of sale and shipment, the practices of the live stock markets and yards, the market classifications and grading, the export and import trade, etc. Considerable library work is required in this subject, studying comparative market reports and market development. Visits are also made to stock yards, transportation agencies, packing houses, etc.

19. **HORSE TRAINING.** Two credit hours. First term. *Tu., Th., at 9.* Professor MARSHALL.

A study of equine intelligence and the training and development of the horse to the purposes of man. This also includes the study of methods of riding and driving, etc.

20. **MEATS AND MEAT PRODUCTS.** Two credit hours. Second term. *Tu., Th., at 9.* Professor PLUMB.

Methods of slaughter of farm animals, the preparation of the carcass and the various products derived therefrom.

21. THE HARNESS AND VEHICLE. Two credit hours. Third term. *Tu., Th., at 9.* Professor MARSHALL.

A study of the harness and vehicle, their history and development, construction, and adaptability to various uses in connection with the horse.

22. BIOGRAPHICAL STUDIES OF MASTER BREEDERS. One credit hour. Third term. Time to be arranged. Professor PLUMB.

A series of lectures discussing the lives and methods of famous master breeders of live stock.

23. TYPES AND CLASSES OF CATTLE AND SHEEP. Four credit hours. First term. *M., W., F., at 11; Tu. or Th., 1 to 4.* Mr. WILLIAMS.

A discussion of the various types of cattle and sheep and the market classes. Judging work will include specimens of the various types and classes judged by score card, comparison, etc.

24. TYPES AND CLASSES OF HORSES AND SWINE. Four credit hours. Second term. *M., W., F., at 11; Tu. or Th., 1 to 4.* Professor MARSHALL, Mr. WILLIAMS.

A discussion of the various types and classes and grades of horses and swine. Judging work will include score card and comparative studying of individuals and groups.

26. DAIRY CATTLE. Four credit hours. Third term. *M., Tu., Th., at 10; W., 1 to 4.* Professor PLUMB, Mr. WILLIAMS.

The different breeds of dairy cattle will be studied, a limited amount of score card work conducted, and considerable judging by comparison in group method. Dairy herds in the vicinity of Columbus will also be visited.

TWO-YEAR COURSE

1. TYPES AND BREEDS OF LIVE STOCK. Four credit hours. Three terms. *M., W., F., at 8; Tu., 8 to 11, or M., 1 to 4.* Professor PLUMB.

Text-book and discussion on the history, characteristics, adaptability, economic value, etc., of types and breeds of live stock. Practical work in judging one afternoon a week, both score card and comparative group work being used.

3. FEEDING ANIMALS. Three credit hours. Second term. *M., W., F., at 9.* Mr. WILLIAMS.

A study of the principles of nutrition, character, and composition of feed stuffs and methods of feeding different kinds of farm animals under various conditions.

5. PRINCIPLES OF BREEDING. Four credit hours. Third term. *M., W., F., at 9.* Laboratory to be arranged. Professor MARSHALL.

Text-book, lectures, and recitations upon the subject of heredity in its applications to the breeding of farm animals. Library research is required and for laboratory work a study of pedigrees, problems in heredity, etc., as worked out from the herd books.

25. DAIRY CATTLE. Four credit hours. First term. *M., W., F., at 9.* Laboratory to be arranged. Professor PLUMB, Mr. WILLIAMS.

Text-book and discussion of the history, characteristics, economic value, etc., of breeds of dairy cattle. Practical work in judging one afternoon a week, various methods being used. Herds of cattle in the vicinity will be visited.

GRADUATE WORK IN ANIMAL HUSBANDRY will be provided in this department to suit the needs of the student, under the general rules of the University for this work. Special facilities, however, will be furnished in any one of the following, selected as a major subject, in connection with a minor study pursued in another department: (a) Breed, history, and development; (b) animal nutrition; (c) heredity in its application to the horse; (d) the education and training of the horse; (e) wool and its uses; (f) live stock registration; (g) live stock markets; (h) live stock judging.

These are offered as lines of special study under departmental direction. Special investigational facilities are at hand, in the use of the University stables, the laboratory in agricultural chemistry, the extensive library of works on animal husbandry, the large stables in and about Columbus, etc. No animal husbandry department in America has at its disposal a more comprehensive supply of material for the student of the horse.

ARCHITECTURE

(Brown Hall)

PROFESSOR BRADFORD, MR. HASKETT

9. HISTORY OF ARCHITECTURE. Three credit hours. First term. Lectures illustrated by lantern slides. *M. W. F., at 9.* Professor BRADFORD.

10. Continuation of 9. Three credit hours. Second term. *M., W., F., at 9.* Professor BRADFORD.

11. Continuation of 10. Three credit hours. Third term. *M., W., F., at 9.* Professor BRADFORD.

ART

(Hayes Hall)

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ASSOCIATE PROFESSOR LAVER, ASSISTANT PROFESSOR TITSWORTH

10. DESIGN AND COMPOSITION. Two credit hours. First term. *M.*, *W.*, or *F.*, 1 to 4.

A course designed to develop appreciation of harmony of line, space, and color. Brings into play the creative imagination and establishes a basis for critical judgment along all art lines. Representative study of flowers, grasses, foliage, trees, and landscape for lines of growth and color. Space relation, original designs with straight and curved lines. Nature motives used in design and composition. Study of color theory and harmony. Design for book covers, posters, etc. Charcoal, pencil, ink, and water color are mediums used.

11. Continuation of 10. Two credit hours. Second term. *M.*, *W.*, or *F.*, 1 to 4.

Study of form in common and beautiful objects. Relation of design to construction and use of object and adaptation of suitable ornament. Composition with still life forms. Study of action and proportion as found in the human figure and other animals. Application of same to design. Study of historic ornament. Designs for textiles and rugs. Study of dark and light in design. Application of color schemes.

12. Continuation of 11. Two credit hours. Third term. *M.*, *W.*, or *F.*, 1 to 4.

Landscape. Spring flowers and foliage. Conventionalization of nature forms for use in design. Landscape composition. Designs for interiors.

BACTERIOLOGY

(Office, Veterinary Laboratory Building)

PROFESSOR MORREY, ASSOCIATE PROFESSOR M'CAMPRELL, MR. GROSVENOR

These courses in Bacteriology are open to advanced undergraduate and graduate students only. The instructor in charge must be consulted before electing.

5. GENERAL BACTERIOLOGY. Three to five credit hours. First term. Lecture, *Tu.*, at 9, or *M.*, at 11; quiz, *Th.*, at 9, or *F.*, at 11; laboratory, *Tu.*, *Th.*, 1 to 4, or *W.*, *F.*, 1 to 4. Professor MORREY, Associate Professor McCAMPBELL, Mr. GROSVENOR.

7. PATHOGENIC BACTERIOLOGY. Three to five credit hours. Second and third terms. Time same as Course 5. Prerequisite, Course 5. Professor MORREY, Associate Professor McCAMPBELL.

8. DAIRY BACTERIOLOGY. Three to five credit hours. Second and third terms. Lecture, *M.*, at 10; quiz, *F.*, at 10; laboratory, *Tu., Th.*, 1 to 4. Prerequisite, Course 5. Professor MORREY.

9. SOIL BACTERIOLOGY. Three to five credit hours. Second and third terms. Lecture, *Tu.*, at 10; quiz, *Th.*, at 10; laboratory, *Tu., Th.*, 1 to 4. Prerequisite, Course 5. Professor MORREY.

13. ADVANCED DAIRY BACTERIOLOGY. Three to five credit hours. Three terms. Prerequisites, Courses 5 and 8, or equivalents. Professor MORREY.

14. ADVANCED SOIL BACTERIOLOGY. Three to five credit hours. Three terms. Prerequisites, Courses 5 and 9, or equivalents. Professor MORREY.

2. AGRICULTURAL BACTERIOLOGY. Three credit hours. Second term. For two years courses in Agriculture and Horticulture.

BOTANY

(Botanical Hall)

ASSOCIATE PROFESSOR SCHAFFNER, ASSISTANT PROFESSOR GRIGGS, ASSISTANT PROFESSOR DACHNOWSKI, MISS DETMERS

The department offers good facilities for instruction and investigation. A large number of charts, many of them lithographs, photographs, and mounted illustrative specimens, are among the appliances for daily class work. The museum contains a large amount of illustrative material; the native medicinal plants and the collection of Ohio woods being very complete. The State herbarium consists of between fifteen and twenty thousand sheets of Ohio plants. The large laboratory is well equipped with dissecting and compound microscopes, also the usual appliances for doing both elementary and advanced morphological and physiological work. The green house attached to the Botanical building is an important adjunct to the department, furnishing much fresh material for laboratory use. It is also used as

a laboratory to carry on special work when growing plants are used.

1. **ELEMENTARY BOTANY.** Four credit hours. Third term. Text-books, Coulter's *A Text-book of Botany*, and Kellerman's *Spring Flora* (New edition). *M., W., F., at 8.* Laboratory, one period, time to be arranged. Miss DETMERS.

This is a general course introductory to those that follow. It comprises mostly organography and plant physiology and a study of the native flora, but some instruction is also given in ecology and classification. The students are required to do some work in the field in both observation and collecting.

6. **GENERAL BOTANY.** Four credit hours. First term. Text-books, Curtis' *Nature and Development of Plants*, Schaffner's *Laboratory Outlines for General Botany*. *M., at 10; M., F., 1 to 4, or Tu., Th., 1 to 4, or Tu., Th., 9 to 12.* Assistant Professor GRIGGS.

This course is a general survey of the plant kingdom by the method of types. It is intended to give a general view of the evolution of plants from the lowest to the highest.

7. Continuation of Course 6. Four credit hours. Second term. Time same as Course 6.

8. **PLANT PATHOLOGY.** Four credit hours. Third term. Time same as Course 6. Assistant Professor GRIGGS.

The diseases of plants due to inorganic causes are briefly studied, but the main part of the course is devoted to a study of the parasitic fungi most destructive to cultivated plants. Each student takes some economic subject or group of parasites for special study and is required to prepare a complete report on the same.

13. **MORPHOLOGICAL AND ECONOMIC BOTANY.** Three terms. Three credit hours. Text-books, Curtis' *Nature and Development of Plants*, Schaffner's *Laboratory Outlines for General Botany*. *W., 1 to 4; M., 1 to 3.* Miss DETMERS.

This is intended for students who desire a general course in which the practical and economic aspects of botany are emphasized. It is especially designed for students of domestic science. A general survey of the plant groups, the physiology of plants, the important vegetable products of commerce, the culinary, and fiber producing plants, a study of the tissues, of starches, fibers, etc., yeasts, fermentation, food-destroying fungi, identification of edible and poisonous mushrooms, are important topics of the course. Students are required to do some field work.

17. FOREST BOTANY. Four credit hours. Three terms. Prerequisite, Botany 6, 7, and 8, or 21. *Tu., Th., at 3*; laboratory, field work and seminars, *Tu., Th., 1 to 3*. Assistant Professor DACHNOWSKI.

It includes a study of native and introduced trees and the preparation of a dendrological herbarium; attention is given to the determination of trees by means of leaf and twig characters. This is followed by a study of the development of woods, characters of coniferous, hard, and soft woods and changes due to attacks of fungi. The students are required to prepare a series of gross and microscopic sections. In the spring term a study is made of the genetic development of local forests, as well as other ecologic conditions, and a general consideration of fungi injurious to trees and wood. Students are required to prepare a pathological herbarium.

9. DENDROLOGY. Two or three credit hours. Third term. Time to be arranged. Associate Professor SCHAFFNER, Miss DETMERS.

Laboratory and field work on the local trees and shrubs. Students are required to prepare a dendrological herbarium.

11. LABORATORY WORK IN ECONOMIC BOTANY. Two to five credit hours. Three terms. Time to be arranged. Prerequisite, Botany 6, 7, and 8. or equivalent. Associate Professor SCHAFFNER.

Special investigations in economic botany, including plant pathology and agrostology.

CHEMISTRY

(Chemistry Hall)

PROFESSOR M'PHERSON, ASSOCIATE PROFESSOR EVANS, ASSISTANT PROFESSOR WITHROW, MR. VOGT, MR. MORRIS, MR. LUCAS,
AND DEPARTMENT FELLOWS

The laboratories of the department accommodate over one thousand students. Each laboratory is equipped with all the necessary conveniences—water, gas, electric lights, distilled water piped from a large still in the attic, steam ovens, automatic air blasts, suction pumps, etc. The department is liberally supplied with the best apparatus and materials for both lecture room and laboratory work. Each student has his own desk, with drawers and locker. All supplies are procured from the chemical store room, which

has always on hand a complete stock of all necessary materials.

7. **ELEMENTARY CHEMISTRY.** Four credit hours. First and second terms. Lecture, *M.*, at 8 or 3; quiz, *Th.*, 11 or 1; *F.*, at 8, 9, 10, 1; Laboratory, *M.*, *Tu.*, 1 to 4, or *Th.*, *F.*, 1 to 4, or *W.*, 1 to 4; *S.*, 8 to 11, or *Tu.*, *Th.*, 9 to 12. Associate Professor EVANS, Mr. VOGT, Mr. MORRIS and department fellows.

During the first term, the work is confined to a study of the non-metals and the general laws of chemistry. The metals are studied during the second term. The laboratory work bears directly on the subject under discussion in the class room.

44. **GENERAL CHEMISTRY.** Four credit hours. First and second terms. Lecture, *W.*, at 9; quiz, *Th.*, 11 or 1; *F.*, 9 or 10; laboratory, same as Course 7. Professor MCPHERSON, Associate Professor EVANS, Mr. VOGT, Mr. MORRIS and department fellows.

Lecture, quiz, and laboratory work. This course is arranged for students who present chemistry as an entrance requirement.

3. **ELEMENTARY CHEMISTRY.** Four credit hours. Short courses. First and second terms. Lecture, *M.*, at 10; quiz, *Th.*, at 8; laboratory, *M.*, *Tu.*, 1 to 4, or *Th.*, *F.*, 1 to 4. Associate Professor EVANS, Assistant Professor WITHROW, Mr. VOGT, Mr. MORRIS, and department fellows.

12. **QUALITATIVE ANALYSIS.** Four credit hours. Third term. One lecture, one quiz, and six hours laboratory work. For time, see 7 or 44. Associate Professor EVANS, Assistant Professor WITHROW, Mr. VOGT, Mr. MORRIS and department fellows.

After working through the preliminary tests for the acids and metals, each student is required to work out a number of unknown substances.

45. **QUALITATIVE ANALYSIS.** Four credit hours. One lecture, one quiz, and six hours laboratory work. Short courses, third term. For time, see 3. Associate Professors EVANS, Assistant Professor WITHROW, Mr. VOGT, Mr. MORRIS, and department fellows.

42. **ELEMENTARY ORGANIC CHEMISTRY.** Two credit hours. Third term. *M.*, *F.*, at 9. Associate Professor EVANS.

This course consists in a study of a few of the more important classes of organic compounds, preparatory to the work in agricultural chemistry.

34. ORGANIC CHEMISTRY. Five credit hours. First term. Lectures, *W., F., at 8*; quiz to be arranged; laboratory, *M., Tu., 1 to 4, or Th., F., 1 to 4*. Second year, Domestic Science.

46. ORGANIC CHEMISTRY. Two credit hours. First, second, and third terms. Two lectures weekly. *Tu., Th., at 10*. Prerequisite, Courses 20, and 21, except by special permission of the instructor. Professor McPHERSON, Mr. LUCAS.

47. ORGANIC CHEMISTRY. Two or three credit hours. First, second, and third terms. Six or nine hours laboratory work weekly. Laboratory open afternoons. Professor McPHERSON, Mr. LUCAS.

CIVIL ENGINEERING

(Office, Brown Hall, Room 33)

PROFESSOR SHERMAN, PROFESSOR ENO, ASSISTANT PROFESSOR SCHLAFLY,
ASSISTANT PROFESSOR CHAMBERLIN, MR. WARD.

30. SURVEYING. Five credit hours. Civil Engineering, second year, first term. *M., W., F., at 9*. Laboratory to be arranged. Prerequisite, Mathematics 14 or 42. Professors SHERMAN, ENO, Assistant Professors SCHLAFLY and CHAMBERLIN, Mr. WARD.

4. TOPOGRAPHICAL DRAWING. Four credit hours. Platting, pen and tinted work. Reed's Topographic Drawing and Sketching. Civil Engineering, second year, second term, *M., Tu., 1 to 4; W., 1 to 3; or Th., F., 2 to 4; S., 8 to 12*. Prerequisite, Drawing 26 to 32. Professor SHERMAN, Professor ENO.

DAIRYING

(Townshend Hall)

PROFESSOR ERF, MR. NYSTROM, MR. CLEVINGER, MR. STEINER

The dairy laboratories permit of work along the following lines: milk testing, buttermaking, cheesemaking, the care and bottling of sanitary milk, and dairy mechanics.

Individual milk testing apparatus is furnished, and in the laboratory are found the necessary Babcock testers, balances, etc. The creamery laboratory is equipped with various styles of cream separators, cream ripeners, starters, cans, and churns. The cheese laboratory is well equipped and has a cold curing room and a cellar for curing brick and

Swiss cheese. Butter is made throughout the year on a creamery basis from the milk and cream from a number of dairies aggregating over two hundred cows. The sanitary milk room is a model, containing a complete "Star" outfit which includes a steam pressure sterilizing chest. A fine refrigerator is provided for the bottled milk, and the whole is placed on a practical basis of operation, the milk from the University herd being standardized on a fat basis, bottled and sold, students doing the work.

The dairy mechanics' work is provided for in a power house with equipment of boiler, engine, mechanical refrigerating plant, pumps, pipe fitting apparatus, and soldering outfits.

It is intended that the laboratory work shall be of the most practical kind, and is supplemented by lectures, recitations, and quizzes in the class room.

The work of the department is designed for three classes of students, namely, the regular students in the two and four-year courses, and a special winter class of dairymen, who come for the special dairy course designed to train dairymen who cannot devote a longer time to scientific dairy methods, and dairy farmers.

12. PRINCIPLES OF DAIRYING. First term. Four credit hours. *Tu., Th., at 1.* Laboratory, *Tu., Th., 2 to 4.* Professor ERF, Mr. NYSTROM.

Lectures on secretion and testing of milk and cream for butter-fat; feeding and caring for dairy cows as related to the economical production of milk; formation of profitable herds; testing individual cows and herds for butter-fat production, and also how to enter and test cows for the advanced registries. In the laboratory, practical work will be given in testing milk and cream for butter-fat; testing dairy herds for butter-fat production; and practice in operating farm cream separators.

14. BUTTERMILKING. Five credit hours. First term, and duplicated in the second and third terms. Time to be arranged. Mr. CLEVENGER.

In the lecture room, the principles of making butter, including cream separation, pure cultures, churning, packing and marketing butter, will be thoroughly discussed. In the laboratory, the work discussed in the lecture room will be put into practice.

16. CHEESE AND FANCY DAIRY PRODUCTS. Five credit hours. Second term. Time to be arranged. Mr. NYSTROM.

While cheesemaking is the basis of this course, and demonstrations will be given in the manufacture of Cheddar, Swiss, and brick cheese, the subject will be treated from the standpoint of the farmer who sells his milk to the factory rather than that of the cheesemaker. Fancy products, such as cottage, Neufchatel, and soft cream cheese, junkets, ice cream, etc., will be considered.

22. DAIRY MECHANICS. Three credit hours. First term. Mr. NYSTROM.

This work will consist of one lecture and two three-hour laboratory periods. It will treat of the construction and operation of the steam boiler and engine, steam pumps, belting, hanging of shafting and pulleys, pipe fitting and soldering. It is intended to train the students to do the mechanical work in a farm dairy, cheese factory, and creamery.

23. ADVANCED DAIRYING. Three credit hours. Second and third terms. Professor ERF.

Work in dairy mechanics or buttermaking may be continued or a seminar on assigned readings in experiment station and other dairy literature will be arranged, and laboratory work suggested by the line of reading may be pursued.

24. DAIRY EQUIPMENT. Two credit hours. Second term. *Tu., Th., at 1.* Laboratory, *Tu., Th., 2 to 4.* Professor ERF.

Lectures on planning and equipping dairy barns, yards, milk houses, dairy plants, farm ice houses and refrigerators, etc. In the laboratory practical work will be given in pipe fitting, soldering, operating gas engines, setting up dairy machinery, etc., necessary to equip a farm or creamery plant.

26. FARM DAIRYING. Four credit hours. Third term. *Tu., Th., at 1.* Laboratory, *Tu., Th., 2 to 4.* Prerequisite, 12 and 24. Professor ERF.

Lectures on handling and the manufacturing of dairy products for the market; on dairy farm management, comparing the profitableness of each of the different systems of dairying under various conditions. In the laboratory, practical work will be given in the

manufacture of butter, soft cheese, ice cream, and other farm dairy products.

27. CITY MILK SUPPLY. Two credit hours. First term and duplicated in the second and third terms. Time to be arranged. Mr. STEINER.

Practical work in the handling and distribution of milk for city trade, including the treatment of milk, marketing and cooling, clarifying, pasteurizing, standardizing, and bottling of milk and cream, testing milk for butter-fat and total solids, method of determining the bacterial content and the leucocytes in milk in order to have it comply with the standards laid down by all the city ordinances.

28. ADVANCED DAIRYING. Five to ten credit hours. Three terms. Professor ERF.

This course is intended for graduate students only.

DOMESTIC SCIENCE

(Hayes Hall)

PROFESSOR WARDALL, ASSOCIATE PROFESSOR WHITE, ASSOCIATE PROFESSOR FLINT

I. DOMESTIC SCIENCE

1. THE SELECTION AND PREPARATION OF FOODS. Three credit hours. First term. *M.*, at 8; *M.*, *Tu.*, 1 to 3, or *Th.*, *F.*, 1 to 3, or *Tu.*, *Th.*, 8 to 10. Prerequisite, Chemistry 7 or 44. Professor WARDALL, Associate Professor WHITE.

A study of food principles, their occurrence in food stuffs, effects of heat, and fermentation, and the comparative cost of nutrients from various sources. Lecture and recitation work is combined with laboratory work. Laboratory fee, \$3.00.

2. Continuation of 1. Three credit hours. Second term. Time same as Course 1.

3. Continuation of 2. Three credit hours. Third Term. Time same as Course 1.

4. DIETETICS. Second term. Four credit hours. *M.*, *F.*, at 9; *M.*, *F.*, 10 to 12. Prerequisite, Domestic Science, 1, 2, 3; Physiology 1, and Agricultural Chemistry 14. Professor WARDALL.

A study of the principles of diet, food in its relation to health, standard dietaries, construction of dietaries and diet in disease. The principles of home nursing and preparation of food for the

sick are given at the close of the other work. Lecture, recitation, and laboratory work are combined. Laboratory fee, \$3.00.

10. THE HOUSE. Three credit hours. Third term. *M., W., F., at 9.* Associate Professor WHITE.

Situation of the house with regard to general surroundings. The householder's interest in the construction of the house. Sanitary conditions in and around the house. Ventilation, water supply, heating, and plumbing. The purpose of the house. Prerequisite, Bacteriology 5.

11. HOUSEHOLD MANAGEMENT. Three credit hours. Third term. *M., W., F., at 11.* Prerequisite, Courses 1, 2, 3, 10, and 4. Associate Professor WHITE.

The aim of this course is to set forth some of the principles underlying housekeeping, including the organization of the household, division of income, household processes, and care of the household.

12. TEACHERS' COURSE. Three credit hours. First term. Professor WARDALL.

This course is designed for the student who prepares to teach. Courses of study are examined, and practice given in making them. Some practice is given in presenting and criticising lesson plans.

13. SEMINARY. Two to five credit hours. Three terms. Open only to fourth year and graduate students. Time to be arranged. Professor WARDALL, Associate Professor WHITE.

II. DOMESTIC ART

1. TEXTILES. Two credit hours. First term. Recitation, *W., at 11.* Laboratory sections, *Tu., W., or Th., 1 to 3.* Prerequisite, or concurrent, Art 10, 11, 12. Laboratory fee, \$1.00.

This course includes the study of fabrics from an historic, economic, and social standpoint. In the laboratory the making of garments involves the proper selection of material and the working out of suitable designs.

2. A continuation of Course 1. Two credit hours. Second term. Recitation *W., at 11.* Laboratory sections, time same as Course 1.

3. A continuation of Course 2. Two credit hours. Third term. Recitation, *W., at 11.* Laboratory sections, time same as Course 1.

4. DRESS. Four credit hours. First term. Recitation, *W.* at 9. Laboratory, *Tu., Th., 10 to 12, or M., F., 1 to 3.* Prerequisite, Courses 1, 2, 3. Laboratory fee, \$1.00. Art 13, 14, 15 must be taken with this work.

In this course economics, hygiene, design, and color are considered in their relation to dress. The laboratory work includes the drafting and designing of patterns, the careful selection and combination of materials, and the making of dresses.

5. HOUSEHOLD ART. Four credit hours. Second term. Recitation, *Th.,* at 8. Laboratory, same as Course 4. Laboratory fee, \$1.00. Prerequisite, or Concurrent Art 13, 14, 15.

This course includes the study of house furnishings, their color, design, suitability for purpose and cost. The laboratory work consists of visits to shops, the making of plans and estimates for house furnishing and the designing and making of accessories in furnishing and decorating the house.

8. A continuation of Course 5. Four credit hours. Third term. Recitation *Th.,* at 8. Laboratory, same as Course 4. Laboratory fee, \$1.00.

6. TEACHERS' COURSE. Three credit hours. Second term. Time to be arranged. Prerequisite, Courses 1, 2, 3, 4, 5, 7. Laboratory fee, \$1.00.

Subjects of interest to teachers are discussed. Relation of domestic art to modern education. Problems of equipment and cost. Planning and practice in the presentation of lessons. Visits to schools.

NOTE.—In all courses students provide their own materials.

DRAWING

(See Engineering Drawing)

ECONOMICS AND SOCIOLOGY

(University Hall. Office, Room 211)

PROFESSOR HAGERTY, PROFESSOR HAMMOND, ASSISTANT PROFESSOR LOCKHART, MR. DORNEY

I. ECONOMICS

33. PRINCIPLES OF ECONOMICS. Three credit hours. Three terms. *M., W., F.,* at 8 or 9. Mr. DORNEY.

A careful study of the laws of production, exchange, distribution, and consumption of wealth; combined with an analysis of the

industrial actions of men as regards land, labor, capital, money, credit, rent, interest, wages, etc. Text-book, lectures and individual investigations.

42. PUBLIC FINANCE AND TAXATION. Two credit hours. First and second terms. *Tu., Th., at 2.* Prerequisite, 33. Assistant Professor LOCKHART.

This course aims to make the student acquainted with the theory of public revenue and expenditure, and with the leading systems of financial administration throughout the world.

43. FINANCIAL HISTORY OF THE UNITED STATES. Third term. two credit hours. *Tu., Th., at 2.* Prerequisite, Course 42. Assistant Professor LOCKHART.

44. TRANSPORTATION. Two credit hours. *M., W., F., at 9.* Three terms. Prerequisite, 33. Professor HAMMOND.

The public character of the transportation industry. Growth of the railway system and the principal lines of communication. The organization and management of railroads. Railway rates, pools, mergers, and consolidations. Railway commissions and public control. Government ownership.

II. SOCIOLOGY

These courses are not open to first-year students. It is recommended that Course 1 be preceded by Economics 30, 31, 32, or 33, and Psychology 1, or Zoology 31.

1. PRINCIPLES OF SOCIOLOGY. Three credit hours. Three terms. Sec. I, *M., W., F., at 8*; Sec. II, *M., W., F., at 9.* Professor HAGERTY and Assistant Professor McKENZIE.

ENGINEERING DRAWING

(Brown Hall, Rooms 42, 46)

PROFESSOR FRENCH, ASSISTANT PROFESSOR LEWIS, ASSISTANT PROFESSOR MEIKLEJOHN, ASSISTANT PROFESSOR ROGERS,
MR. TIDBALL, MR. NORRIS

10. MECHANICAL DRAWING. Three credit hours. First term. *W., 1 to 4; S., 8 to 11.* Professor FRENCH, Assistant Professor MEIKLEJOHN.

Lectures and practice. Elementary mechanical drawing, lettering and working drawings.

20. MECHANICAL DRAWING. One credit hour. First term. *W., 1 to 4.* Professor FRENCH.

Lectures and practice. Elementary mechanical drawing and lettering.

14. PEN DRAWING. Two credit hours. First term. Prerequisite, Course 28. Time to be arranged. Mr. NORRIS.

15. HOUSE PLANNING. One and one-half credit hours. Second and third terms. *W.*, 1 to 4. Prerequisite, Course 20. Professor FRENCH.

40. CLAY MODELING. Two credit hours. Architecture, third year, second term, *Th.*, *F.*, 1 to 3; Domestic Science, third year, third term, *M.*, *Tu.*, 3 to 5. Prerequisite, Drawing 26 or equivalent. Assistant Professor LEWIS.

41. CLAY MODELING. Two credit hours. Architecture, third year, third term, *Th.*, *F.*, 1 to 3; Domestic Science, third year, third term, *M.*, *Tu.*, 3 to 5. Prerequisite, Drawing 40. Assistant Professor LEWIS.

ENGLISH

(University Hall, Rooms 117 to 120)

1. PARAGRAPH WRITING AND ANALYSIS OF PROSE. Two credit hours. First term, *W.*, *F.*, at 8; *Tu.*, *Th.*, at 8, 9, 10, 11, 1, or 3; *M.*, *F.*, at 10 or 11; *W.*, *F.*, at 3; *M.*, *F.*, at 2. (Course 1 will be repeated in the second term and the third term for the benefit of those who fail, the class meeting Saturdays at 9 a. m., in Room 119.) All instructors.

2. EXPOSITORY WRITING. Two credit hours. Second term. Prerequisite, Course 1. Same hours as for Course 1. (Course 2 is also offered in the Summer Term.) All instructors.

3. BRIEF MAKING AND WRITTEN ARGUMENTATION. Two credit hours. Third term. Prerequisite, Course 1. Same hours as for Course 1. (Course 3 is also offered in the Summer Term.) All instructors.

4b. EXTEMPORE SPEAKING. Two credit hours. Third term. *W.*, *F.*, at 2. Prerequisite, Course 3. Assistant Professor BLANCHARD.

5. ADVANCED COMPOSITION: EXPOSITION AND CRITICISM. Two credit hours. First term. *Tu.*, *Th.*, at 11. Prerequisite, Course 1. Associate Professor GRAVES.

6. ADVANCED COMPOSITION: DESCRIPTION AND NARRATION. Two credit hours. Second and third terms. *Tu.*, *Th.*, at 11. Prerequisite, Course 1. Associate Professor GRAVES.

8. GENERAL SURVEY OF ENGLISH LITERATURE. Three credit hours. Three terms. *M., W., F., at 8, 9, 11, or 3.* No prerequisite course. Professor McKNIGHT, Associate Professor GRAVES, Assistant Professors DUNCAN, LEIGHTON and BURNHAM.

45. AMERICAN LITERATURE. Two credit hours. Three terms. *Tu., Th., at 8.* No prerequisite course. Professor TAYLOR.

FORESTRY

(Horticultural Hall)

PROFESSOR LAZENBY, MR. THOMPSON

For field work in Forestry, the University estate has a typical primitive woodlot, a fringe of forest trees bordering the Olentangy river, and a good collection of individual trees and shrubs on the campus. Columbus and vicinity offer fairly good opportunities for the study of forestry. Numerous electric car lines take the student, at small cost, to a variety of hard wood forests, where different conditions and methods of treatment can be studied. Lumber yards, dry houses, wood working industries and saw mills are to be found in the city.

In laboratory work students receive instruction in timber physics and certain features of wood technology, and for this a collection of wood specimens, sections of trees, etc., is provided, and will be increased as rapidly as possible. Students will be encouraged to carry on original work, and to write theses under the supervision of an instructor. Special credit is given for such work, but a thesis is not required for a degree.

1. INTRODUCTION TO FORESTRY. One credit hour. First term. Time to be arranged.

A general presentation of the subject, its objects, methods, and economic importance. Lectures and field work.

2. INTRODUCTION TO FORESTRY. Two credit hours. Third term. Time to be arranged.

A survey of forest literature and forest organizations, including state and national forest services. Lectures and recitations.

3. ARBORICULTURE. Four credit hours. Third term. Time to be arranged.

The cultivation and management of trees for various specific purposes, such as windbreaks, hedges, shade and ornament, or small plantations for post timber, for maple syrup, for nuts, etc.

4. SILVICULTURE. Three credit hours. First term. Time to be arranged.

Lectures and field work. Includes a study of soil, climate, exposure and other factors influencing forest growth; descriptions of typical woodlands and forests; collecting and testing forest tree seeds.

5. SILVICULTURE. Three credit hours. Second term. Time to be arranged.

Care of woodlands and forests, including pruning, thinning, protection from fire and other inanimate and animate enemies. Lectures and field work.

6. SILVICULTURE. Three credit hours. Third term. Time to be arranged.

Forest reproduction by natural and artificial means; practice in seedbeds and nursery; sowing seeds and transplanting in forests; establishment and extension of wood lots. Lectures and field work.

7. FOREST MENSURATION. Four credit hours. First term. *M., Tu., Th., F., at 10.*

Lectures and field work. Methods of measuring the volume of felled and standing trees; of ascertaining the volume of definite forest areas; studying the age, rate of growth and future yield of trees and forests; making stem or section analysis; estimating values of trees and forest stands.

8. WOOD TECHNOLOGY AND TIMBER PHYSICS. Four credit hours. Second term. *M., Tu., Th., F., at 10.*

Lectures and laboratory work. Uses and physical properties of wood.

9. FOREST UTILIZATION. Four credit hours. Third term. *M., Tu., Th., F., at 10.*

Lectures and field work. Methods of lumbering, including clearing of wood lots, transportation, milling, and marketing; minor wood lot and forest industries.

10. FOREST MANAGEMENT. Four credit hours. First term. Time to be arranged.

Lectures and field work. Preparation of working plans for wood lots and forests; forest survey, administration, regulation; investment methods employed in the United States and abroad.

11. FOREST ECONOMICS. Four credit hours. Second term. Time to be arranged.

Lectures and seminar. Statistics of areas, product, and trade; relation of forests to climate, soil, waterways, and general welfare.

12. FOREST POLICIES. Four credit hours. Third term. Time to be arranged.

Lectures and seminar. State and national forest legislation and organization; state and national forests, and forest problems; civil service regulations; foreign forest service.

GEOLOGY

(Orton Hall)

PROFESSOR PROSSER, PROFESSOR BOWNOCKER, ASSISTANT PROFESSOR
HUBBARD, MR. MORSE

The University offers excellent facilities for the study of Geology. By an act of the Legislature it has been put in possession of all the collections made by the State Geological Survey, and these collections have been supplemented by valuable additions of fossils and minerals from various sources. This collection embraces a representation of every geological formation shown in Ohio. Orton Hall, completed at a cost of more than \$100,000, is designed for the permanent accommodation of the large geological collection of the University and for the work and instruction in the department of Geology. A portion of it, at present, is occupied by the library and reading room. The building is two stories in height, with a high basement; is built of brick and faced with sandstone, and is fireproof throughout. Some of the material was contributed by various quarries of the State of Ohio, and almost all of the finer varieties of Ohio building stone are represented in the columns, walls, and ceiling panels of the vestibule.

1. **ELEMENTARY PHYSIOGRAPHY.** Five credit hours. Third term. *M., Tu., W., Th., at 11*; Laboratory, *Th., 1 to 3*. Assistant Professor HUBBARD.

The physiographic features of the earth's surface and the agencies producing them; the atmosphere, and the ocean. Recitations, lectures, and map work. One period per week will be devoted to laboratory or field work.

2. **GENERAL GEOLOGY.** Five credit hours. First term. Lectures and recitations, *M., Tu., W., F., at 11*; laboratory, *Th., 8 or 9*; field work, first half of term, *F.* afternoon or *S.* forenoon, when the *F.* lecture will be omitted. Professor PROSSER, Mr. MORSE.

Structural, dynamical, and historical geology. The lectures are illustrated by maps, specimens, and lantern views. The common rock-forming minerals and rocks are studied in the laboratory; while in the field specimens are collected, sections measured, formations identified, and the student given an idea of the method of work pursued by a field geologist.

5. **APPLIED GEOLOGY.** Four credit hours. Second term. Lectures, *M., Tu., W., Th., at 8*; laboratory, *F., at 8*. Professor BOWNOCKER.

The common minerals and rocks composing the earth's crust, their disintegration and decomposition. Soils, their origin and classification; the soils of the United States, and especially those of Ohio. Fuels, coal, oil, and gas. Building stones, limes, and cements.

GERMANIC LANGUAGES AND LITERATURES

(University Hall, Rooms 317 and 320)

PROFESSOR RHOADES, ASSOCIATE PROFESSOR EISENLOHR, ASSISTANT PROFESSORS THOMAS AND BUSSE, MR. BUSEY, MISS BARROWS

1. **ELEMENTARY.** Four credit hours. Three terms. *M., Tu., Th., F., at 9, 10, 11, or 2*.

Elements of inflection and syntax, translation of easy prose, prose, composition and practice in reproduction of texts read.

2. **SCIENCE READING.** Four credit hours. Third term. Prerequisite, first and second terms of Course 4. *M., Tu., Th., F., at 9, 10, or 2*.

4. **INTERMEDIATE GERMAN.** Four credit hours. Three terms. Prerequisite, Course 1, or two years High School work. *M., Tu., Th., F., at 9, 10, 11, or 2*.

Translation of standard prose, prose composition, and grammatical drill. In the third term the class will read one or more of the plays of Schiller.

To students offering four entrance units in German other courses are open. Such students should confer with the head of the department.

HORTICULTURE

(Horticultural Hall)

ASSISTANT PROFESSOR DAVIS, MR. THOMPSON

This department controls about fifteen acres of land. About one-half of this area has been planted with representative varieties of the common tree fruits. A few of the small fruits are also represented. The remainder of this area is devoted to market gardening. Two green houses, each about one hundred feet long and twenty feet wide, are devoted to the growing of lettuce, tomatoes, cucumbers, and radishes in a commercial way. A few of the hardier flowering plants are also propagated and grown in considerable quantity. Cold frames and pipe heated and manure hot beds are available for practical work in connection with the garden operations. One interesting feature in the management of the houses and hot beds is the method of watering by sub-irrigation, which originated in these houses. A small nursery is maintained, and several thousand cuttings and grafts are made each year. The orchards give extensive practice in pruning. The ornamental grounds contain a large variety of evergreens and deciduous trees and shrubs. The laboratories are equipped with a drying oven, balances, seed testers, and other appliances for study and research. A small collection of horticultural hand tools, seeds, and other preserved natural specimens are also available for study and comparison. About fifteen colonies of bees are available for laboratory work in apiculture.

Courses 1, 2, 3, 6, 8, 10, 15, 16, 17, 18, and 19 were formerly listed under the same numbers in the department of Horticulture and Forestry.

1. PRINCIPLES OF HORTICULTURE. Four credit hours. Three terms. Two-year courses in Horticulture and Agriculture. Lectures and recitations, *M., W., F., at 9; Laboratory, Tu., 1 to 3, or Th., 9 to 11.*

2. VEGETABLE FORCING. Four credit hours. Second term. Two-year course in Horticulture. Time to be arranged. Laboratory or practicum. Assistant Professor DAVIS.

A study of the history and development of different types of plant houses, including methods of heating, ventilating, and general management.

3. PLANT PROPAGATION. Four credit hours. Third term. Four year course in Agriculture. Lectures and recitations, *M., W., F., at 9; laboratory or practicum, M., or F., 1 to 3.* Assistant Professor DAVIS.

The theory and practice of multiplying plants by seeds, layers, cuttings, grafts, and divisions; pruning and training; spraying; history of the development and use of insecticides and fungicides, together with a study of different remedies for particular insects and plant diseases.

6. PRINCIPLES OF FRUIT CULTURE. Four credit hours. Second term. Four-year course in Agriculture. Lectures and recitations, *M., W., F., at 9; laboratory and practicum, M. or F., 1 to 3.* Assistant Professor DAVIS.

A study of the location, tillage, and fertilizing of orchards and gardens; the selection of varieties, laying out, planting, and general management of fruit plantations; harvesting, marketing, and storing fruit.

8. ORNAMENTAL PLANTS. Two credit hours. First term. Two and four-year courses in Horticulture. Time to be arranged.

A study of the history, classification, general characteristics, propagation, and culture of ornamental plants, together with their uses for home and public grounds.

9. WINDOW GARDENING AND FLORICULTURE. Two credit hours. Second term. Two and four-year courses in Horticulture. Time to be arranged.

Including the general management of house plants, the home conservatory, commercial greenhouse, and the propagation and uses of flowers and plants for decoration.

10. HOME GARDENING. Two credit hours. Third term. Four year course in Horticulture. Time to be arranged.

The location, planting and management of the kitchen garden, and the laying out and treatment of the ornamental grounds about the home.

15. LANDSCAPE GARDENING. Three credit hours. Third term. Two and four-year courses in Horticulture. *M., W., F., at 8*; practicum, *F., 1 to 3*.

A study of the art of producing picture-like or landscape effects; the making of lawns, walks, and drives, and the correct planting of trees, shrubs, and flowers for the external adornment of home and public grounds.

16. NATURE STUDY. Two credit hours. First term. *Th., at 11*; *M., 1 to 3*. Assistant Professor DAVIS.

A course intended primarily for those who are or expect to become teachers; treating of the objects and aims of nature study, with lectures on some of the interesting things to be found everywhere about us, indicating how such material can be advantageously used by the teacher in class room work.

17. PLANT VARIATIONS. Two credit hours. Second term. Four-year course in Horticulture. *Tu., Th., at 9*.

A course designed for those interested in plant breeding and in the modification and improvement of plants by mutation, crossing, dwarfing, forcing, etc., together with a discussion of the current theories of evolution as applied to the variation and amelioration of plants under cultivation.

18. APICULTURE. Three credit hours. Second term. Two and four-year courses in Horticulture. *Tu., Th., at 10*; practicum, *Th., 1 to 3*.

A course in the theory and practice of bee-keeping. Lectures, recitations, and practice.

19. POMOLOGY. Four credit hours. Three terms. Two-year courses in Horticulture and Agriculture. *M., W., F., at 8*; *W., or F., 1 to 3*.

Including the propagation, pruning, cultivation, harvesting, marketing, etc., with special reference to the fruits commonly grown in the temperate zone.

21. PRINCIPLES OF HORTICULTURE. Four credit hours. Three terms. Four-year course in Horticulture. *M., W., F., at 11; Th., 1 to 3.* Assistant Professor DAVIS.

The principles of plant growth, with special reference to horticultural crops, including the problem of tillage, drainage, frosts, weeds, insects, propagation, pruning, and spraying.

22. POMOLOGY. Four credit hours. Three terms. Four-year course in Horticulture. *Tu., Th., F., at 10; laboratory or practicum, W., 1 to 3.* Assistant Professor DAVIS.

Including the propagation, pruning, spraying, cultivating, harvesting, marketing, etc., with special reference to the fruit commonly grown in the temperate zone. Tropical and sub-tropical fruits of commercial importance in the North will also receive consideration.

24. OLERICULTURE OR VEGETABLE GARDENING. Four credit hours. Three terms. Four-year course in Horticulture. Time to be arranged. Assistant Professor DAVIS.

Including a study of location, soils, manures, and fertilizers; marketing, etc., as related to the home and market gardener. Each of the garden vegetables are considered specifically.

INDUSTRIAL ARTS

(Hayes Hall, Rooms 2, 6, and 17)

PROFESSOR SANBORN, MR. CROWE, MR. BEEM

The shops occupy the north wing of Hayes Hall and afford excellent facilities for instruction in both the practical details and the underlying principles of carpentry, pattern-making, and forging. The carpenter and pattern shops are equipped with twenty-five benches with complete sets of carpenter tools for each, twenty-four turning lathes with the necessary turning tools, a pony planer, a buzz planer, a circular rip and cross-cut saw, a scroll saw, a band saw, a trimmer, and power grindstone. The forge shop is equipped with twenty stationary forges with anvils and tools for each, a heating forge, a portable hand forge, a foot power hammer, a blacksmith's drill and a punch, shear, and bar-cutter.

1. CARPENTRY AND PATTERN MAKING. *M., Tu., 1 to 4, or Th., F., 1 to 4; W., 1 to 4, S., 8 to 11; Tu., Th., 9 to 12; M., F., 8 to 11.*

Practice in carpentry, wood-turning, and pattern-making, including sawing, planing, mortising, framing, and other work involving the use of the ordinary carpenter tools; center and chuck turning, and the making of simple patterns.

2. FORGING. Time, same as Course 1.

The use and care of forge, fire, and tools; practice in iron and steel forging, including such operations as cutting, bending, drawing, upsetting, shaping, and welding iron; the making, hardening, and tempering of steel punches, drills, and cold chisels.

MATHEMATICS

(University Hall, Room 314)

PROFESSOR BOHANNAN, ASSISTANT PROFESSOR PRESTON

1. ELEMENTARY ALGEBRA. Five credit hours. First term. Venable. *M., Tu., W., Th., F., at 9.* Assistant Professor PRESTON.

3a. PLANE GEOMETRY. Five credit hours. Second term. Venable. *M., Tu., W., Th., F., at 9.* Assistant Professor PRESTON.

31. COLLEGE ALGEBRA. Five credit hours. First term. *M., Tu., W., Th., F., at 8, 9, 11, 1, 2, or 3.* Professors BOHANNAN, McCOARD, SWARTZEL, KUHN, Associate Professors ARNOLD, RASOR, Assistant Professors PRESTON, BAREIS.

32. PLANE TRIGONOMETRY. Five credit hours. Second term. *M., Tu., W., Th., F., at 8, 9, 11, 1, 2, or 3.* Professors BOHANNAN, McCOARD, SWARTZEL, KUHN, Associate Professors ARNOLD, RASOR, Assistant Professors PRESTON, BAREIS, Mr. CHAMBERS.

METEOROLOGY

(Townshend Hall)

MR. J. WARREN SMITH

1. METEOROLOGY. Two credit hours. Second term. Text-book, Waldo. Time to be arranged. Formerly Astronomy 3.

Lectures on practical meteorology and climatology, supplemented by laboratory work in map making. The daily weather maps are discussed and used as a basis for the practical side of the work. Instruction is given in handling the principal meteorological instruments.

MILITARY SCIENCE AND TACTICS

(Office, The Armory)

CAPTAIN GEORGE L. CONVERSE, U. S. A., RETIRED

The Military Department is open five days during each week of each term. Required of all students first and second year, unless excused by the Military and Gymnasium Board.

1. MILITARY DRILL. One credit hour. First and third terms. *M., Tu., W., at 11 or 4.*

2. MILITARY DRILL. One credit hour. Second term. Drill Regulations, *M., Tu., W., at 11 or 4*; Gallery Practise, *M., Tu., W., Th., 1 to 5.*

PHYSICAL EDUCATION FOR MEN

(Gymnasium)

DR. WINGERT, MR. WARFIELD, MR. KIBLER

1. GYMNASIUM. One credit hour. Three terms. Two hours per week is required during first year of student's residence at University, or until he has completed three terms of this work.

A physical examination is required of all first year men during the early part of the fall term. Rational body building gymnastics and recreation.

PHYSICAL EDUCATION FOR WOMEN

(Gymnasium)

MISS SEARING

1. GYMNASIUM. One credit hour. Three terms. Four hours per week during first year of student's residence at University is required. *M., Tu., Th., F., 9, 10, or 11; W., 9 or 11.*

A physical examination is made of all women in the department by the director during the early part of the fall term. Well regulated physical exercises are given to meet the needs of every student.

2. GYMNASIUM. One credit hour. Three terms. Four hours per week required of all young women during second year of course. *M., Tu., Th., F., 9, 10, or 11; W., 9 or 11.*

PHYSICS

(Physics Building, First Floor)

ASSISTANT PROFESSOR EARHART

1. **ELEMENTARY PHYSICS.** Five credit hours. First and second terms. *M., Tu., Th., F., at 11.* One laboratory period per week required. Laboratory to be arranged. Assistant Professor EARHART.

Recitations and laboratory practice. Other courses in Physics may be elected by four-year students in Agriculture.

ROMANCE LANGUAGES AND LITERATURES

(Office, University Hall, Room 305)

PROFESSOR BOWEN, PROFESSOR BRUCE, ASSOCIATE PROFESSOR INGRAHAM,
ASSISTANT PROFESSOR PEIRCE, MR. EWINGTON, DR. FALORSI

I FRENCH

1. **ELEMENTARY FRENCH.** Four credit hours. Three terms. Grammar: Thieme and Effinger's or equivalent. Reader: Aldrich and Foster's, or Bowen's First Scientific. Historical and narrative prose; one or more prose comedies. Sec. I, *M., Tu., Th., F., at 9* (Arts only); Sec. II, III, and IV, *M., Tu., Th., F., at 10*; Sec. V and VI, *M., Tu., Th., F., at 11*; Sec. VII and VIII, *M., Tu., Th., F., at 2.* All instructors in the department teach one or more sections of this course.

Stress laid upon the acquisition of a correct pronunciation, after which the entire energy of the student is directed toward the attainment of a full and accurate reading knowledge of the language. Grammar and composition made to contribute to this end. Sight reading emphasized.

2. **MODERN FRENCH LITERATURE.** Four credit hours. Three terms. Sec. I, *M., Tu., Th., F., at 9*; Sec. II and III, *M., Tu., Th., F., at 10*; Sec. IV, *M., Tu., Th., F., at 11.* Prerequisite, Course 1 or equivalent. Professor BRUCE, Assistant Professor PEIRCE, Mr. EWINGTON.

The study of the literature as such is now taken up. The work of the year deals with the following subjects: (1) Contes; (2) The Novel (Balzac or Hugo); (3) Lyric Poetry (Bowen's Modern French Lyrics); (4) Romantic Drama (Hugo). Prose composition. Systematic attention given to syntax and idiom. Lectures supplement the work. Private reading required.

II SPANISH.

1. ELEMENTARY SPANISH. Four credit hours. Three terms. Grammar (Hills' and Ford's or Edgren's), and Ingraham's *Victoria y Otros Cuentos*. Easy prose and plays. Composition and conversation. Sec. I, *M., Tu., Th., F., at 9*; Sec. II, *M., Tu., Th., F., at 11*; Sec. III and IV, *M., Tu., Th., F., at 2*. Professor BOWEN, Associate Professor INGRAHAM, Mr. EWINGTON.

2. MODERN SPANISH LITERATURE. Four credit hours. Three terms. *Tu., W., Th., F., at 3*. Prerequisite, Course 1 or equivalent. Associate Professor INGRAHAM.

The Modern Novel and Drama. Lectures covering a survey of the literature. Composition and conversation continued.

RURAL ECONOMICS

(Townshend Hall)

PROFESSOR PRICE

The subject of Rural Economics has received comparatively little attention until recently by American agricultural colleges, and, at the present time, there is little uniformity in the treatment of the subject in the different institutions in which it is offered. The department includes instruction in farm management, history of agriculture, and agricultural economics.

The facilities offered for the study of Farm Management include the University farm, containing over three hundred acres, and the records that have been kept of its operations for many years. Adjoining Columbus, and within reach by electric cars, there are many well equipped and well managed farms, which are frequently visited by classes in this department.

For the study of the history of agriculture and agricultural literature, the University Library offers excellent facilities in the large number of agricultural works which it contains and the complete files of agricultural periodicals. In the study of agricultural economics access is had to the State Library, as well as the University Library, and ex-

cursions are made in the State to investigate agricultural conditions.

1. RURAL ECONOMICS. Four credit hours. Third term. Two-year courses in Agriculture and Horticulture. Professor PRICE.

Lectures, recitations, and visits to farms in the vicinity of Columbus. The course will include a comparative study of the different systems of farm management; the cost of producing and marketing farm products; methods of renting, leasing, and operating farm lands; and keeping farm accounts and records.

2. FARM MANAGEMENT. Four credit hours. First term. *M., Tu., Th., at 11; S., 8 to 12.* Professor PRICE.

Lectures and recitations upon the problems of farm management, the relative profits of different systems of farm management, and their effect upon maintaining the fertility of the land. The business of farming from the standpoint of the individual is studied.

4. HISTORY AND LITERATURE OF AGRICULTURE. Four credit hours. Second term. *M., Tu., Th., F., at 11.* Professor PRICE.

Lectures and recitations upon the history of agriculture and the evolution of agricultural methods, with special reference to the agriculture of the present day. The development of agricultural literature, together with literature of the present and current periodicals, are studied.

6. AGRICULTURAL ECONOMICS. Four credit hours. Third term. *M., Tu., Th., F., at 11.* Professor PRICE.

Lectures and recitations upon the production, distribution, transportation, and marketing of agricultural products. The relation of the industry of agriculture to other industries, co-operation in agriculture, agricultural organizations, and the social conditions of agriculture are considered.

8. FARM ACCOUNTS AND RECORDS. Two credit hours. First term.

Lectures and practice work. The course will deal with the general principles of accounting and their application to farm business. Systems of keeping farm records that are best adapted to different methods of farming will be studied.

10. RESEARCH WORK FOR GRADUATE STUDENTS. Five to ten credit hours.

Opportunity is offered to carry on special lines of research in farm management, history and literature of agriculture and in agricultural economics.

SHOP WORK
(See Industrial Arts)

SPANISH
(See Romance Languages)

VETERINARY MEDICINE
(Veterinary Laboratory)

PROFESSOR WHITE, PROFESSOR SISSON

Students in Agriculture taking required or elective work in Veterinary Medicine can avail themselves of the whole equipment of the College of Veterinary Medicine. For the class room work a large number of papier-mache models, wet and dry anatomical specimens, sample horse-shoes, charts, diagrams and drawings, surgical instruments, and apparatus are constantly employed to supplement textbook teaching. The Veterinary Hospital affords excellent facilities for the care and treatment of diseased and injured animals.

The new Veterinary Laboratory building is especially designed for the teaching of Veterinary Medicine. It contains the Veterinary Museum, probably the largest in the country, a modern sanitary dissecting room, and laboratories for anatomy, pharmacology, pathology, and bacteriology.

28. VETERINARY ANATOMY. Four credit hours. First term. Recitations, *M., Tu., Th., F., at 10.* Professor SISSON.

Brief outline of the anatomy of the horse and ox.

29. VETERINARY PRACTICE. Four credit hours. Second term. Recitations, *M., Tu., Th., F., at 10.* Professor WHITE.

The more common diseases of a non-infective character, to which farm animals are subject. Minor surgery, castration, and the principles of horseshoeing are included in this course.

30. VETERINARY HYGIENE AND SANITATION. Four credit hours. Third term. Recitations, *M., Tu., Th., F., at 10.* Professor WHITE.

The more common diseases of a non-infective character to farm and dairy animals, and the most scientific methods of preventing, dealing with, and treating the same.

ZOOLOGY AND ENTOMOLOGY

(Biological Hall, Rooms 3, 4, 7, 8, and 9)

PROFESSOR OSBORN, PROFESSOR LANDACRE, ASSOCIATE PROFESSOR HINE,
MR. SEVERIN

Work in this department is largely on the laboratory plan, the effort being to have each student become familiar with typical forms of animal life, acquire the power to discover facts for himself, and use them on practical applications. Animals that have an important economical relation are used as examples for their respective groups. While the aim is to give a thorough and sound training in the underlying principles of zoology and entomology, the practical bearing of these is shown by use of such forms as the liver fluke of sheep to show effects and relations of parasitism; the earth-worm in its relation to soil formation; trichina as affecting human health and meat exports; insects, both useful and injurious; fishes as a source of food; relation of birds to insect control; and importance of certain groups of birds and mammals as the source of our domestic animals. Advanced and graduate courses provide for training in methods of research, and especial attention is given to preparation for investigation as experiment station workers.

1. INVERTEBRATE AND VERTEBRATE. Three credit hours. Invertebrate, first and second terms; Vertebrate, third term. *Tu., Th., at 8, or M., F., at 10; M., W., or F., 1 to 3; W., 8 to 10; S., 8 to 10.* Professor OSBORN, Professor LANDACRE, Mr. SEVERIN.

This course includes a general discussion of groups, dissection of types, and an outline of classification. Especial attention is given to forms of economic importance either from their detrimental effects on crops, stock, etc., or from their utility in various industries or as domestic species.

3. ECONOMIC ENTOMOLOGY. Three credit hours. Third term. Lecture, *Tu., Th., at 11*; laboratory, *F., 1 to 3*. Prerequisite, Course 4. Associate Professor HINE.

Insects of forest, orchard, and garden. A detailed study of injurious species intended particularly for students of Horticulture.

The work includes field studies, collections, reports on observation, etc.

4. ECONOMIC ENTOMOLOGY. Three credit hours. Three terms. Lecture, *Tu., Th., at 8*; laboratory, *Tu., Th., or S., 9 to 11*. Prerequisite. Course 1. Associate Professor HINE.

A systematic study of groups of insects, with special reference to injurious and beneficial species. A foundation is laid for special study in Entomology. Preparation of collections, essays, life studies, and use of remedial measures, along with laboratory studies on general anatomy.

7. SYSTEMATIC AND PRACTICAL ENTOMOLOGY. Three credit hours. Elective in short course in Agriculture, first, second, and third terms; short Horticulture, first year. Lectures, *M., W., F., at 8*; laboratory, *M., 1 to 3*. Associate Professor HINE.

8. PARASITES OF DOMESTIC ANIMALS. One credit hour. First term. Elective. Time to be arranged. Professor OSBORN.

A lecture course devoted to the principal parasites affecting domestic animals, intended especially to meet the needs of those who intend to give particular attention to stock raising.

9. SPECIAL ENTOMOLOGY. Four credit hours. First term. Elective in Junior or Senior year. Lecture, *M., W., at 3*; laboratory, time to be arranged. Professor OSBORN.

Studies of life histories, collection, and classification in selected groups. Field work and lectures.

10. SPECIAL ENTOMOLOGY. Four credit hours. Second term. Elective in Junior or Senior year. Lecture, *M., W., at 3*; laboratory, time to be arranged. Professor OSBORN.

Studies of winter condition of insects. Insecticides, insecticide machinery, methods of preparing insect illustrations, greenhouse pests, etc.

11. SPECIAL ENTOMOLOGY. Four credit hours. Third term. Elective in Junior or Senior year. Lecture, *M., W., at 3*; laboratory, time to be arranged. Professor OSBORN.

Investigations of selected groups or species. Lectures on insect legislation, distribution, natural enemies, special methods of control, etc.

[Courses 9, 10, and 11 are intended as practical courses in entomological research, adapted especially for those who wish to give special attention to this branch with reference to future work in

agriculture or horticulture, and to furnish a preparation for those who have in view work as entomological investigators in experiment stations or as teachers in agricultural schools. They may be taken as graduate courses if not elected earlier, or continued as special lines of research during a graduate course embracing other special subjects.]

26. ZOOLOGICAL SEMINAR. One credit hour. Three terms. Time to be arranged. Professor OSBORN, Professor LANDACRE, Associate Professor HINE.

Discussion of recent literature in zoology and entomology, reviews of progress in certain lines of investigation and presentation of research studies. Advanced students in Zoology and Entomology are expected to elect this course, and it is open to others who have had preliminary courses.

GENERAL INFORMATION

REGISTRATION AND EXPENSES

Students will be required to register Tuesday, September 21, 1909, and class work in all departments will begin the following day. Former students who fail to register as above will be charged one dollar, in addition to the usual incidental fee, for the first day of delinquency, and fifty cents additional for each subsequent day.

COLLEGE DUES

Each student is required to pay an incidental fee of six dollars a term.

A laboratory fee of one dollar per term is charged in all courses in which laboratory work is given, and students are required to pay for materials used in laboratories in addition to the laboratory fees.

The gymnasium is free to all students, but those desiring a locker will be charged a fee of one dollar a term.

All term dues must be paid at the opening of each term as a condition of admission to classes.

A fee of five dollars to cover expenses of graduation, diplomas, etc., is required of each person receiving one of the ordinary degrees from the University, and this fee must be paid before the degree is conferred.

OTHER EXPENSES

Boarding clubs are formed in the neighborhood of the University. Furnished rooms are rented at seventy-five cents to one dollar and twenty-five cents a week for each student, and the cost of table board is two and one-half dollars to four dollars a week. A limited number of women students will be given table board at Oxley Hall at a price not to exceed three dollars and a half a week.

Board with furnished rooms can be obtained in private families, within convenient distances of the University, at rates varying from four dollars to five dollars a week. It will be necessary for women students desiring to obtain room and board at Oxley Hall to make application in advance to Miss Dora Eaton, Oxley Hall, Columbus, Ohio.

The uniform with which the members of the regiment are required to provide themselves costs (without overcoat) about fourteen dollars. It is quiet in pattern and is designed to be worn daily in place of civilian dress.

The expenses of a student in the University for a year may be estimated as follows, excluding clothing (except uniform) and traveling expenses:

	Low.	Average.	High.
Incidental fees	\$ 18 00	\$ 18 00	\$ 18 00
Laboratory materials	15 00	15 00	25 00
Books and stationery . . .	15 00	25 00	40 00
Room	35 00	37 00	75 00
Furniture	10 00
Board	90 00	115 00	175 00
Uniform	14 00	14 00	14 00
	<hr/>	<hr/>	<hr/>
	\$197 00	\$224 00	\$347 00

The second and third estimates for room include light, fuel, and care. The third estimate is for a room occupied by a single student. The requirements for laboratory fees and books depend upon the course of study pursued. There is no need of a student spending more than the "average" for the items mentioned; many spend less.

FREE SCHOLARSHIPS

A free scholarship, good for two years in the College of Agriculture and Domestic Science, is granted to one student annually from each county in Ohio, but not more than two

scholarships can be in force at any one time from any county.

Each scholarship is valid for two years from its grant, and covers incidental and fixed laboratory fees. In the chemical laboratories a student holding a free scholarship shall be required to pay for materials used and to make a deposit to cover breakage the same as other students. In case of other than new students the scholarship will be accepted only after approval by the Board of Trustees. All scholarships must be presented to the Secretary of the Board of Trustees on or before November 1st of the year in which they are to be used, otherwise they are not valid.

The free scholarships cannot be used in the special winter term courses. The appointments are made by the County Boards of Agriculture, and are not transferable by the appointees. To learn whether the scholarship of a given county for the current year has been granted, inquiry should be addressed to the Secretary or President of the County Agricultural Society. For further information concerning these scholarships, inquiries should be addressed to the Dean of this College.

CHRISTIAN ASSOCIATIONS

The Young Men's Christian Association has come to occupy a prominent place in university life. It has a membership of about four hundred men, and is affiliated with the World's Student Christian Federation. The Association House furnishes free for the use of its members a reading room, library, magazines and papers, piano, and telephone—a college home.

Religious meetings are held for men on Sunday afternoon; there are also frequent meetings for the promotion of social intercourse and good fellowship. Courses in systematic Bible study and in modern missions are offered. A most helpful feature of the work is that in the interest of

new students at the opening of the school year. Desirable rooms and boarding places are found and posted for reference at the Association House. Representatives of the Association meet the trains, assist students in finding satisfactory locations, and endeavor in every way to make them feel at home. The Employment Bureau helps to find work.

A copy of the Students' Handbook, giving information about Columbus, the University, and the various college organizations and activities, will be sent free to prospective students. For this handbook or for further information, address the General Secretary of O. S. U. Y. M. C. A., 39 West Tenth avenue, Columbus, Ohio.

The Young Women's Christian Association holds religious meetings regularly at noon on Tuesdays. This organization is active and efficient in working for the higher interests of the young women. Young women planning to enter the University are invited to correspond with reference to board or rooms with the General Secretary, O. S. U. Y. W. C. A., University Hall, Columbus, Ohio.

SELF SUPPORT

There is a large amount of work on the University farm and campus and in the gardens, orchards, and green-houses, which can be done by students, for which they are paid at current rates for such labor, and each year several thousand dollars are paid out in this way. By this means, together with what can be earned by steady labor during the summer vacation, a considerable number of students defray all their expenses.

Preference is given to students who are willing to devote a certain number of hours each day to the work assigned.

Work cannot be promised to all applicants, and is not guaranteed to any.

Applications for employment should be made to the Superintendent of the University farm. Labor blanks will be furnished upon request.

CADET SERVICE

Under the law of Congress establishing the University, it is required that instruction shall be given in military science and tactics, and the Trustees have directed that all male students, except those in the College of Law, and such others as may be specially excused for physical disability or for having reached the age limit of twenty-five years, shall render two years of cadet service as a condition of graduation. A uniform has been prescribed, with which each member is required to provide himself.

PHYSICAL EDUCATION

Physical Education is conducted under the direct supervision of the Director, who is a graduate physician and member of the University Faculty. He is assisted by an associate director for women, also an assistant and twenty student aids, who are selected each year from the upper classmen and those who show proficiency in their work. The main floor of the gymnasium (80 by 150 ft.) is thoroughly equipped with the most modern gymnastic apparatus. It is used by the women in the forenoon while the men exercise in the new gymnasium on the first floor. In the afternoon the main floor is used exclusively by the men for class work, athletics, basketball, recreative games, etc. Regular class exercise two hours per week is required during the first year of a student's residence at the University, or until he has successfully completed three terms of this work. A thorough physical examination is made of each student at the opening of the college year. Physical defects, abnormalities, and weaknesses are noted, and judicious, healthful exercise is prescribed to fit the student's individual needs.

LIST OF ACCREDITED AND RECOGNIZED SCHOOLS IN OHIO

Accredited schools are those four-year secondary schools whose courses of study have been found by inspection to be capable of satisfactorily preparing students for all colleges of the University.

Recognized schools are those three or four-year secondary schools whose courses of study are not capable of preparing students for all colleges of the University, but which have been found by inspection to cover satisfactorily 10 units of the requirements for admission.

These lists are subject to change from year to year as schools are revisited. Persons are advised, therefore, to consult the latest bulletins and catalogues of the University A, shows that a school is accredited; R, that it is recognized.

School	Superintendent	Principal
Akron, A	H. V. Hotchkiss	D. C. Rybolt
Alliance, R	J. E. Morris	J. E. Vaughan
Andover, R	S. A. Harbourt	Mary McDonald
Arcanum, R	O. G. Hershey	C. W. Bingman
Ashland, R	John A. McDowell	R. C. Clark
Ashley, R	L. K. Wornstaff	Lydia Marsh
Ashtabula, A	E. A. Hotchkiss	
Ashtabula Harbor, R	Robert W. Paterson	John E. Ransom
Ashville, R	Stanley Lawrence	Stanley Lawrence
Athens, A	B. O. Skinner	Zella Foster
Baltimore, R	J. H. Horton	J. J. Wagner
Barberton, R	J. M. Carr	G. M. Kornis
Barnesville, A	W. R. Butcher	A. H. Denbrock
Batavia, R	F. P. Timmons	Cecile Hulick
Beaver Creek Twp., (Greene Co.) R	R. S. Parsons	R. S. Parsons
Bedford, R	O. W. Kurtz	Miss G. L. Thomas
Bellaire, A	Wilson Hawkins	J. A. Jackson
Bellefontaine, A	J. W. MacKinnon	Annie A. Price
Bellevue, A	E. F. Warner	H. C. Bates
Berea, R	J. B. Mohler	A. G. Yawberg
Bethel Township, Clark Co., R	A. K. Morris	Hester Pherson
Bethel Township, Miami Co., R	R. W. Crist	Walter Peoples
Blanchester, R	C. L. Leahy	H. T. Miller
Bluffton, R	C. A. Arganbright	I. W. Geiger
Bowling Green, A	N. D. O. Wilson	Walter F. Shaw
Brookville, R	A. A. Maysilles	Elizabeth Zehring
Bryan, A	J. W. Wyandt	Orville Smith
Buchtel College Academy, R		C. O. Rundell

School	Superintendent	Principal
Bucyrus, A	W. N. Beethan	C. H. Miller
Byesville, R	B. M. Thompson	R. M. Marlowe
Cadiz, R	J. R. Lehman	S. L. Eby
Caldwell, R	C. J. Foster	Patrick Henry
Cambridge, A	H. Z. Hobson	John H. Harding
Camden, R	J. L. Fortney	L. D. Brouse
Canal Dover, A	F. P. Geiger	A. J. Huffman
Canal Winchester, R	A. A. McEndree	Sara Brown
Canton, A	John K. Baxter	Chas. A. Armstrong
Cardington, R	F. H. Flickinger	W. J. Banker
Carey, R	A. J. Nowlan	Mattie Myers
Carroll, R	E. C. Dilger	J. H. Cooper
Carthage, R	C. A. Wilson	Louise Sherer
Cedarville, R	F. M. Reynolds	L. T. Marshall
Celina, R	S. Wilkin	J. W. Pogue
Centerburg, R	H. C. Fickell	Lottie Grandstaff
Central Institute (Cleveland), R		James G. Hobbie
Chardon, A	W. R. Davis	Leila B. Phinney
Chicago, R	E. A. Evans	J. H. Booth
Chillicothe, A	F. E. C. Kirkendall	W. H. Rice
Cincinnati—	F. B. Dyer	
Hughes, A		E. W. Coy
Walnut Hills, A		W. T. Harris
Woodward, A		E. D. Lyon
Cin. Tech. School, A		L. M. Ballou
Circleville, A	W. E. Sealock	D. B. Clark
Cleveland—	W. H. Elson	
Central, A		Edward L. Harris
East, A		B. U. Rannells
Lincoln, A		James W. McLane
South, A		G. A. Reutenik
West, A		C. L. Lynch
Glenville, A		H. H. Cully
Cleveland Heights, A	C. A. Tilden	C. A. Tilden
Clintonville, R	W. S. Jennings	W. S. Jennings
Clyde, R	A. L. Gantz	Leroy Patton
College Corner, R	C. E. Gillespie	Edith Francisco
College Hill, A	W. H. Altamer	G. M. Tremper
College of Ursuline Sisters (Tiffin)		Sister Mary Agnes
Collinwood, A	Frank P. Whitney	F. C. Rulon
Columbiana, R	W. H. Richardson	Linda L. Snyder
Columbus—	Jacob A. Shawan	
Central, A		W. M. Townsend
East, A		J. D. Harlor
North, A		C. D. Everett
South, A		C. S. Barrett
Columbus School for Girls, A		{ Miss G. L. Jones
Columbus Grove, R	J. T. Begg	{ Miss Alice Gladden
		W. E. Stevens

School	Superintendent	Principal
Conneaut, R	Calvin T. Northrop	Louise E. Kahler
Corning, R	F. W. Huston	J. S. Saffell
Coshocton, A	C. E. Bryant	F. D. Garbison
Covington, A	L. J. Bennett	Frances Bowdle
Crestline, R	H. D. Clarke	G. A. Davis
Cumberland, R	G. E. Bell	W. S. Kingston
Cuyahoga Falls, R	W. H. Richardson	H. O. Bolich
Dayton, A	E. Brown	Chas. L. Loos, Jr.
Defiance, A	F. E. Reynolds	H. B. Mullholand
DeGraff, R	N. H. Stull	R. B. Curl
Delaware, A	W. McK. Vance	Maude I. Myers
Delphos, A	E. L. Mendenhall	I. F. Matteson
Delta, A	G. W. Hoffman	Viola B. Wilkins
Dennison, R	W. H. Angel	I. A. Wilson
Deshler, R	W. M. Schumacher	E. O. Fairchild
Dresden, R	E. E. Smock	Ida Warden
East Cleveland, A	W. H. Kirk	W. H. Kirk
East Liverpool, A	F. H. Warren	Florence Updegraff
Eaton, A	F. B. Bryant	John O'Leary
Eldridge's School (Worthington), R		Mrs. Gertrude D. Eldridge
Elyria, A	W. R. Comings	H. M. Ebert
Euclid, R	J. C. Oldt	Mary E. Gould
Fayette, R	C. D. Perry	E. M. Hoover
Findlay, A	J. W. Zeller	J. F. Smith
Fort Recovery, R	James Ross	Charles Sunderman
Fostoria, A	R. W. Solomon	Ida McDermott
Franklin School (Cincinnati), A		{ Joseph E. White
Fredericktown, R	W. W. Borden	{ G. S. Sykes
Fremont, A	J. E. Collins	W. W. Borden
Friends' Boarding School (Barnes- ville), R		H. M. Lowe
		B. J. Thomas
Galion, A	I. C. Guinther	E. H. White
Gallipolis, A	H. E. Conard	L. W. MacKinnon
Garrettsville, R	E. F. Robison	V. A. Libbey
Geneva, A	J. E. Fitzgerald	J. D. Marshall
Georgetown, R	A. F. Waters	T. E. Hughes
Germantown, A	C. W. McClure	S. M. Heitz
Gibsonburg, R	S. H. Benson	R. E. Stone
Girard, R	B. D. Hirst	W. Ray Wheelock
Glendale, A	E. H. Foster	E. H. Foster
Grand River Insti- tute, A		O. J. Luethi
Granville, R	J. R. Clements	Flora Hoover
Greenfield, A	E. W. Patterson	Roy Harris
Greenville, A	J. J. Martz	J. L. Selby
Greenwich, A	J. H. Diebel	Wm Tait

School	Superintendent	Principal
Grove City, R	A. C. Fries	C. F. Neiswender
Groveport, R	M. C. Warren	J. F. Paxton
Hamilton, A	Darrell Joyce	W. P. Cope
Harmony Township (Clark Co.), R	David Neer	Carlton Henry
Harrison, R	Thos. P. Pierce	Mary A. Curran
Harrison Twp., (Mont. Co.), R	D. W. Klepinger	W. H. Leiter
Harrison Twp (Preble Co.), R	C. S. Bungler	C. A. Huffman
Hartwell, A	J. S. Trisler	J. C. Mauchley
Hicksville, R	C. C. Nardin	A. Z. Penrose
Highland, R	C. W. Johnson	Anna G. Smith
Hilliards, R	Chauncey Lawrence	J. B. Phillips
Hillsboro, A	W. E. Arter	J. B. Conard
Home City, R	J. O. Falkinburg	Clara E. Falkinburg
Hudson, R	T. F. Leonard	Marion Stockwell
Ironton, A	S. P. Humphrey	T. Howard Winters
Jackson, A	J. E. Kinnison	M. A. Henson
Jefferson, A	H. S. Foote	Mary I. Hoskins
Jeffersonville, R	M. E. Wilson	Mrs. Mary A. McCoy
Kent, A	R. P. Clark	W. A. Walls
Kenton, A	N. E. Hutchinson	Joseph T. Glenn
Kingston, R	C. M. Agler	Anna K. Korst
Kingsville, R	W. B. Simcox	
Kirtland, R	A. R. Morris	
Lakeside, A	H. O. Hannah	Margaret Hull
Lakewood, A	J. M. H. Frederick	H. W. Kennedy
Lancaster, A	H. A. Cassidy	W. C. Brashares
Lebanon, R	J. M. Hamilton	J. W. Lyle
Leetonia, R	J. W. Moore	C. C. Kochheiser
Leipsic, R	W. S. Sackett	Le Roy Buckingham
Lexington, R	H. H. Phelps	David Frasher
Lima, A	J. A. Davidson	S. Steffens
Lima Twp., (Licking Co.), R	E. T. Osborn	A. R. Shadle
Lisbon, A	G. M. Bingham	H. S. Moffitt
Lockland, A	S. T. Dial	Howard Hollenbach
Logan, A	H. F. Silverthorn	Chas. C. Garman
London, A	Wm. McClain	Marion Schlesinger
Lorain, R	A. C. Eldredge	D. J. Boone
Madison, R	Geo. C. Von Beseler	Lois Ellet
Madison Township (Pickaway Co.), R	Charles C. Evans	Charles C. Evans
Madisonville, A	C. M. Merry	(Mrs.) J. M. Bryan

School	Superintendent	Principal
Mad River Township (Enon Village), R	J. R. Clarke	J. R. Clarke
Malta, R	George M. Strong	L. E. Coulter
Mansfield, A	H. H. Helter	Harland E. Hall
Mantua, R	C. F. Becker	Alice M. Chalker
Marietta, A	J. V. McMillan	W. H. Maurer
Marion, A	H. L. Frank	C. H. Winans
Martins Ferry, A	L. E. York	O. C. Hursh
Marysville, A	L. B. Demorest	D. H. Sellers
Massillon, A	C. L. Cronebaugh	Goffrey A. Lyon
Mechanicsburg, A	J. W. Bowen	W. G. Snawley
Medina, A	C. C. Carlton	Charles Bulger
Miamisburg, A	W. T. Trump	Harris V. Bear
Middleport, R	A. W. McKay	Sara R. Brown
Middletown, A	Arthur Powell	Geo. C. Stahl
Milford, R	J. L. Fortney	L. D. Grannis
Millersburg, A	O. O. Fisher	A. W. Elliott
Montpelier, R	T. G. Paseo	F. W. Leist
Mt. Gilead, R	C. B. Stoner	F. J. Ryan
Mt. Pleasant, R	F. D. Ring	C. E. Hoskinson
Mt. Sterling, R	Frank E. Wilson	Kathryn Weber
Mt. Vernon, A	J. S. Alan	R. E. Offenhauer
Napoleon, A	P. C. Zemer	F. W. Leist
Nelsonville, A	Aaron Grady	O. C. Jackson
Newark, A	J. D. Simkins	T. Otto Williams
New Bremen, R	C. F. Limbach	J. Halsema
New Carlisle, R	Alfred Ross	Ada B. Koontz
New Holland, R	G. A. Bricker	E. N. Dietrich
New Lexington, R	J. M. Gordon	E. C. Bussert
New London, A	W. H. Mitchell	Stella M. Townsend
New Lyme Insti- tute, A		H. C. White
New Philadelphia, A	G. C. Maurer	G. A. Wylly
New Richmond, R	S. L. Turnipseed	Margueret T. Rowell
New Vienna, R	J. L. Cadwallader	Clifford Thompson
Niles, R	F. J. Roller	W. H. C. Newington
North Baltimore, A	G. L. Brown	Elizabeth Brown
Norwalk, R	A. D. Beechy	James E. Cole
Norwood, A	W. S. Cadman	W. W. McIntire
Oak Harbor, R	H. H. Hoffman	(Mrs.) Sarah R. Gill
Oberlin, A	R. L. Rawdon	W. H. McCall
Oberlin Academy, A		J. F. Peck
Ohio Military Insti- tute, R	A. M. Henshaw	S. P. C. Roberts
Orrville, R	A. H. Etting	A. J. Gerber
Osborn, R	W. H. Batson	Winifred Creamer
Ottawa, A	G. J. Keinath	L. F. Gehres
Oxford Col. Acad., A	Jane Sherzer	Catherine Cox

School	Superintendent	Principal
Painesville, A	F. H. Kendall	A. H. Mabley
Pandora (Riley Township), R	C. D. Steiner	Cary O. Altman
Pataskala, R	E. E. Atwell	J. C. Evans
Pemberville, R	D. J. Williams	Wynonah Thompson
Perrysburg, R	D. A. Haylor	Olive Woodard
Piqua, A	J. R. Beachler	D. R. Ellabarger
Plain City, R	J. A. Runyan	Lola A. Smythe
Pleasant Hill, R	S. C. Morton	J. H. Beeson
Pleasant Ridge, A	F. L. Simmerman	
Pleasantville, R	E. L. Porter	C. W. Andrews
Pomeroy, R	C. T. Coates	Dollie Hooper
Port Clinton, R	C. C. Underwood	Charlotte M. Ward
Portsmouth, A	Frank Appel	W. D. Galliland
Quaker City, R	W. G. Wolfe	J. C. Eagleson
Ravenna, A	E. O. Trescott	H. B. Turner
Reynoldsburg, R	Wm. S. Coy	Lucy Brinkerhoff
Richwood, R	R. H. Allison	B. C. Smith
Ripley, R	R. B. Smith	H. L. Geesling
Sabina, R	M. J. Flannery	Leo E. Plymire
Salem, A	J. S. Johnson	B. F. Stanton
Salineville, R	F. W. Reinoehl	Edna Walls
Sandusky, A	H. B. Williams	Geo. C. Dietrich
Shelby, A	S. H. Maharry	D. J. Schaeffer
Sidney, A	Herbert R. McVay	Lee A. Dollenger
Smead School (Toledo), A	Mary E. Smead	Rose Anderson
Somerset, R	J. W. Davis	E. R. Beck
South Charleston, R	H. W. Paxton	Mrs. E. W. Bradley
Spencerville, R	Thos. J. Class	Wm. Carolus
Springfield, A	Carey Boggess	C. C. Patterson
Steubenville, A	R. L. Ervin	J. Vernon Cox
St. Mary's, A	C. C. McBroom	J. Howard Spohn
St. Paris, R	Jas. H. Fortney	Florence Hunter
St. Raphael's School, A		Sister Rosetta
Sunbury, R	J. J. Phillips	Milton Utley
Swanton, R	C. O. Castle	L. W. Bates
Tiffin, A	C. A. Krout	H. H. Frazier
Tippecanoe City, R	E. R. Rike	A. C. Pense
Toledo, A	Chas. L. Van Cleave	Wm. B. Guitteau
Troy, A	C. W. Cookson	Edward M. Traber
Uhrichsville, A	L. E. Everett	C. W. Jackson
Union City (Ind.), A	W. H. Sidebottom	Edith Huston
University School (Avond., Cin.), A		William E. Stillwell

School	Superintendent	Principal
University School (Cleveland), A		Harry A. Peters
Upper Sandusky, R	R. J. Kiefer	E. L. Wolff
Urbana, A	I. N. Keyser	H. N. Morton
Urbana Univ., A	Paul H. Seymour	Russell Eaton
Ursuline Acad. (Brown Co.), R		Sister M. Baptista
Utica, A	F. P. Householder	
Van Wert, A	J. P. Sharkey	Orrin Bowland
Wadsworth, R	A. J. Krabill	Frank L. Lytle
Wapakoneta, A	Charles Haupt	Mary O. Conrath
Warren, A	C. E. Carey	F. E. Ostrander
Washington C. H., A	James T. Tuttle	Frederic C. Peters
Wauseon, A	C. J. Biery	Orille Eastman
Waverly, R	J. F. Henderson	W. C. Dyer
Wellington, A	R. H. Kinnison	Elizabeth Day
Wellston, A	E. S. McCall	J. W. Whiteside
Wellsville, A	J. L. MacDonald	Ruby C. Mason
West Alexandria, R	L. D. Brouse	Clara Smith
Westerville, R	Lew. W. Warson	J. F. Nave
West Jefferson, R	L. C. Dick	Maie Walker
West Mansfield, R	O. H. Maffet	Mary J. Holloway
West Milton, R	Lee Waldorf	C. H. Teach
West Unity, R	W. A. Salter	Mable Tinkham
Willoughby, A	S. D. Shankland	Edward M. Ottis
Wilmington, R	E. P. West	F. P. Blair
Woodsfield, R	H. J. Scarborough	W. G. Wolff
Wooster, A	D. L. Thompson	Laura B. Kean
Worthington, R	J. J. McDonald	Arthur L. Sperry
Wyoming, A	C. S. Fay	Evelyn M. Prichard
Xenia, A	Edwin B. Cox	Geo. J. Graham
Youngstown, A	N. H. Chaney	Wells L. Griswold
Zanesville, A	W. D. Lash	Ira C. Painter

A large number of schools of other States are on the accredited list of the University, and applicants presenting certificates from schools outside of Ohio must see that the certificates furnish the details of work done in accordance with the regulations specified on page 10.

The Ohio State University Bulletin is issued at least fifteen times during the Academic year, monthly in October, November, and June, and bi-weekly in December, January, February, March, April, and May.

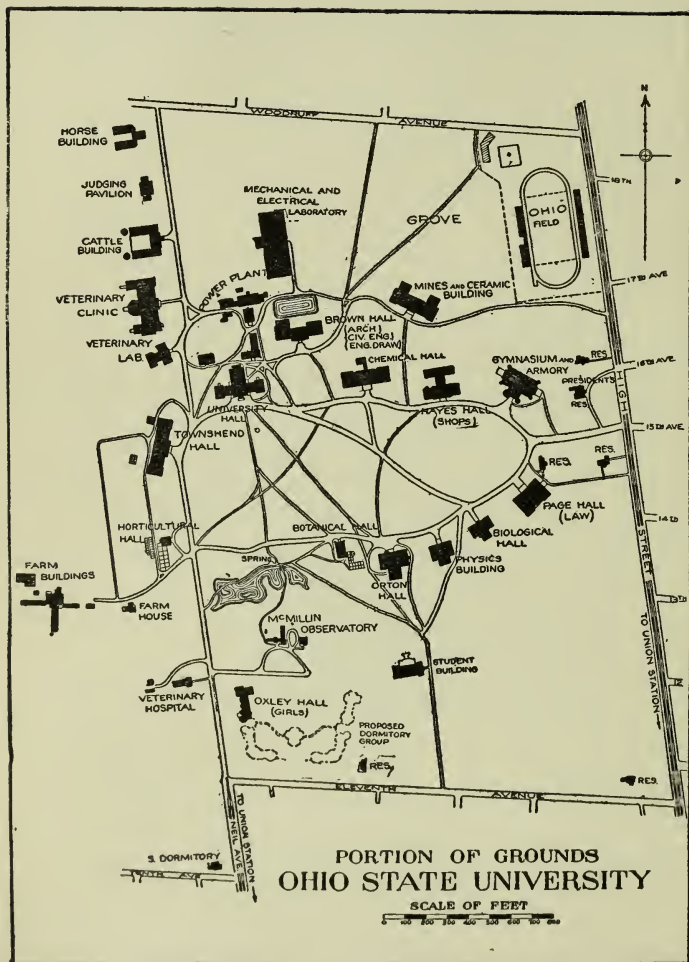
Ohio State University Bulletin

College of Agriculture and Domestic Science



March 3, 1910

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OHIO STATE UNIVERSITY

The Ohio State University, located in Columbus two miles north of the Union Station, is a part of the public educational facilities maintained by the State. It comprises seven colleges:

The College of Agriculture and Domestic Science,
The College of Arts, Philosophy, and Science,
The College of Education,
The College of Engineering,
The College of Law,
The College of Pharmacy,
The College of Veterinary Medicine.

This bulletin of announcements is devoted exclusively to the work of the College of Agriculture and Domestic Science.

[NOTE—In requesting any of the announcement bulletins of the University, address the University Editor, Ohio State University, Columbus, Ohio.]

UNIVERSITY CALENDAR

1910

Entrance examinations (8 a. m.), Tuesday to Saturday,
June 14 to 18.

Summer Term, June 20 to August 12.

Entrance examinations (8 a. m.), Tuesday to Saturday,
September 6 to 10.

First semester begins—Registration Day—Tuesday, Sep-
tember 13.

President's Annual Address (11 a. m.), Friday, Septem-
ber 16.

Latest date of admission to candidacy for a degree at the
Commencement of June, 1911, Saturday, October 1.

Date for mid-semester reports to the Deans concerning de-
linquent students, Saturday, November 19.

Thanksgiving recess, November 24, 25 and 26.

Christmas recess begins Wednesday, December 21.

1911

Christmas recess ends Tuesday, January 3.

First semester ends Friday, February 3.

Second semester begins—Registration Day—Monday, Feb-
ruary 6.

Washington's Birthday, Wednesday, February 22.

Date for mid-semester reports to the Deans concerning de-
linquent students, Saturday, April 1.

Competitive Drill—Cadet Regiment—Saturday, May 27.

Memorial Day, Tuesday, May 30.

Final examinations, Friday to Thursday, June 2 to 8.

Entrance examinations (8 a. m.) Tuesday to Saturday,
June 6 to 10.

Commencement, Wednesday, June 14.

COLLEGE OF AGRICULTURE AND DOMESTIC SCIENCE

The College of Agriculture and Domestic Science offers eight distinct courses of study:

1. A four-year course in Agriculture.
2. A four-year course in Horticulture.
3. A four-year-course in Forestry.
4. A two-year course in Agriculture.
5. A two-year course in Horticulture.
6. A special course in Dairying.
7. A ten-weeks winter course in Agriculture.
8. A four-year course in Domestic Science.

The four-year courses of this College are regular collegiate courses of the University and lead to the degrees of Bachelor of Science in Agriculture, Bachelor of Science in Horticulture, Bachelor of Science in Forestry, and Bachelor of Science in Domestic Science. The requirements for admission to these courses are given in the following pages.

The short courses are for students who are not so well prepared and are unable to spend four years in the University. It has been found that one year of the short course often prepares a student for the four-year course, and that a large proportion of those who enter the short courses find time and means to continue one of the four-year courses.

FACULTY AND INSTRUCTORS

WILLIAM OXLEY THOMPSON, D. D. LL. D., PRESIDENT of the University.

HOMER CHARLES PRICE, M. S. A., DEAN, Professor of Rural Economics and Manager of University Farm.

ALFRED VIVIAN, Ph. G., SECRETARY, Professor of Agricultural Chemistry.

WILLIAM RANE LAZENBY, M. Agr., Professor of Forestry.

HENRY ADAM WEBER, Ph. D., Professor of Agricultural Chemistry.

GEORGE WELLS KNIGHT, Ph. D., Professor of American History.

ALBERT MARTIN BLEILE, M. D., Professor of Anatomy and Physiology.

JOSEPH VILLIERS DENNEY, B. A., Professor of English.

WILLIAM MCPHERSON, Ph. D., Professor of Chemistry.

DAVID STUART WHITE, D. V. M., Professor of Veterinary Medicine.

HERBERT OSBORN M. Sc., Professor of Zoology and Entomology.

FRANK EDWIN SANBORN, S. B., Professor of Industrial Arts.

JOHN ADAMS BOWNOCKER, D. Sc., Professor of Inorganic Geology.

CHARLES SUMNER PLUMB, B. Sc., Professor of Animal Husbandry.

SEPTIMUS SISSON, B. Sc., V. S., Professor of Comparative Anatomy.

CHARLES BRADFORD MORREY, B. A., M. D., Professor of Bacteriology.

JAMES EDWARD HAGERTY, Ph. D., Professor of Economics and Sociology.

THOMAS EWING FRENCH, M. E., Professor of Engineering Drawing.

ARTHUR GILLETT MCCALL, B. Sc. (Agr.), Professor of Agronomy.

OSCAR ERF, B. Sc. (Agr.) Professor of Dairying.

FREDERICK RUPERT MARSHALL, B. S. A., Professor of Animal Husbandry.

RUTH AIMEE WARDALL, M. A., Professor of Domestic Science.

CHARLES A. BRUCE, B. A., Professor of the Romance Languages and Literatures.

FRANCIS LEROY LANDACRE, B. A., Professor of Zoology and Entomology.

WENDELL PADDOCK, M. S., Professor of Horticulture.

JOHN H. SCHAFFNER, M. A., M. S., Associate Professor of Botany.

JAMES STEWART HINE, B. Sc., Associate Professor of Zoology and Entomology.

*VERNON MORELLE SHOESMITH, B. Sc., Associate Professor of Agronomy.

EDGAR S. INGRAHAM, Ph. D., Associate Professor of Romance Languages and Literatures.

CHARLES LINCOLN ARNOLD, M. Sc., Associate Professor of Mathematics.

ANNA K. FLINT, B. S., Associate Professor of Domestic Science.

EDNA N. WHITE, B. A., Associate Professor of Domestic Art.

JOHN F. LYMAN, Ph. D., Associate Professor of Agricultural Chemistry.

FAYETTE AVERY MCKENZIE, Ph. D., Associate Professor of Economics and Sociology.

VERNON HAYES DAVIS, M. S. A., Assistant Professor of Horticulture.

JOHN B. PRESTON, M. A., Assistant Professor of Mathematics.

GRACE M. BAREIS, Ph. D., Assistant Professor of Mathematics.

* Resigned.

CHARLES CLIFFORD HUNTINGTON, M. A., Assistant Professor of Economics and Sociology.

MAY THOMAS, Ph. D., Assistant Professor of the Germanic Languages and Literatures.

ALFRED DACHNOWSKI, Ph. D., Assistant Professor of Botany.

HARRY CLIFFORD RAMSOWER, B. Sc. (Agr.), Assistant Professor of Agronomy.

ERNEST DAVID WAID, B. Sc. (Agr.), Assistant Professor of Agronomy.

ALBERT B. GRAHAM, Superintendent of Agricultural Extension.

JOSEPH NELSON BRADFORD, M. E., Professor of Architecture.

BENJAMIN L. BOWEN, Ph. D., Professor of Romance Languages and Literatures.

GEORGE L. CONVERSE, Captain U. S. A., Professor of Military Science and Tactics.

OLIVE JONES, B. A., Librarian.

H. SHINDLE WINGERT, M. D., Professor of Physical Education.

MATTHEW B. HAMMOND, Ph. D., Professor of Economics and Sociology.

ALICE LITTLEJOHN, M. D., Associate Professor of Physical Education.

WILLIAM LUCIUS GRAVES, M. A., Associate Professor of English.

WILLIAM LLOYD EVANS, Ph. D., Associate Professor of Chemistry.

EUGENE F. MCCAMPBELL, B. Sc., Associate Professor of Bacteriology.

MARY R. LAVER, Associate Professor of Art.

HOMER C. HOCKETT, B. L., Associate Professor of American History.

CARSON SAMUEL DUNCAN, M. A., Assistant Professor of English.

GEORGE DAVID HUBBARD, Ph. D., Assistant Professor of Geology.

THOMAS K. LEWIS, B. Sc., Assistant Professor of Engineering Drawing.

WALTER THOMPSON PEIRCE, Ph. D., Assistant Professor of Romance Languages.

ROBERT F. GRIGGS, M. A., Assistant Professor of Botany.

OLIVER C. LOCKHART, M. A., Assistant Professor of Economics and Sociology.

ROBERT MEIKLEJOHN, M. E., Assistant Professor of Engineering Drawing.

JULIA TITSWORTH, Assistant Professor of Art.

THEODORE ELY HAMILTON, Ph. D., Assistant Professor of Romance Languages.

FREDERICK BROWN HADLEY, D. V. M., Assistant Professor of Comparative Anatomy.

CLEMENT M. BEEM, Instructor in Pattern Making and Founding.

CHARLES P. CROWE, Instructor in Forging.

WILLIAM L. CLEVINGER, Instructor in Butter Making.

JOHN S. TIDBALL, B. S., Instructor in Engineering Drawing.

W. J. NORRIS, Instructor in Engineering Drawing.

F. H. HASKETT, Instructor in Architecture.

FREDERICA DETMERS, M. Sc., Instructor in Botany.

FIRMAN E. BEAR, B. Sc. (Agr.), Instructor in Agricultural Chemistry.

WILLIAM C. MORSE, M. A., Instructor in Geology.

ROBERT C. BUSEY, M. A., Instructor in German.

VITTORIO FALORSI, D. L., Instructor in Romance Languages.

RICHMOND LEE SHIELDS, B. Sc. (Agr.), Instructor in Animal Husbandry.

OMER COLE CUNNINGHAM, B. Sc. (Agr.), Instructor in Dairying.

CREE SHEETS, C. E. (Arch.) Instructor in Engineering Drawing.

HERMAN GUSTAVUS HEIL, Ph. B., Instructor in Physics.

JOHN CHISHOLM, Superintendent of the University Farm.

*GEORGE LIVINGSTON, B. Sc. (Agr.), Assistant in Agronomy.

BYRON MURRAY HENDRIX, B. Sc. (Agr.), Assistant in Agricultural Chemistry.

WILLIAM CASPER LASSETTER, B. Sc. (Agr.) Assistant in Agronomy.

HENRY W. VAUGHAN, M. Sc. (Agr.), Assistant in Animal Husbandry.

LEWIS M. MONTGOMERY, B. Sc., Assistant in Horticulture.

THEODORE WALTER DITTO, B. Sc. (Agr.), Assistant in Zoology and Entomology.

C. R. TITLOW, Assistant in Agricultural Extension.

ELVIN W. BENNAGE, B. Sc. (Agr.), Fellow in Agricultural Chemistry.

* Resigned.

ADMISSION

Applicants for admission must be at least sixteen years of age. The College is open on equal terms to both sexes.

UNIVERSITY ENTRANCE BOARD

The admission of students is in charge of the University Entrance Board, which determines the credits which shall be issued on all entrance examinations and certificates, and furnishes all desired information to applicants. Correspondence relating to admission should be addressed to the Entrance Board, Ohio State University, Columbus.

ADMISSION TO THE COURSE LEADING TO A DEGREE

There are two modes of admission to the course leading to a degree: (a) by certificate, (b) by examination.

ADMISSION BY CERTIFICATE

Applicants may be admitted to the four-year course in Agriculture and to the four-year courses in Horticulture and Forestry* without examination on presentation of properly endorsed certificates from any first or second grade high school in this state, or from approved normal schools or from the State Board of School Examiners or from any school outside of the state which is recognized by the University, under the following provisions:

(a) If from secondary schools, the certificate must show that the applicant is a graduate in good standing of the school issuing it; and also must state in detail the studies pursued, the text-books used, the amount of work

* It is the intention of the University to have all the first and second grade high schools in the state inspected as rapidly as possible, with the idea of preparing a list of schools recognized for these courses. For the present, however, all first and second grade schools will be recognized for the courses in Agriculture, Horticulture, and Forestry.

done in each study, the amount of time devoted to it, and the fact that the applicant has passed in the work.

(b) Any entrance requirement not covered by a certificate must be met by examination.

Blank certificates may be obtained by addressing the Secretary of the Entrance Board. Certificates should be filled out and returned to the University by the proper school official as early as possible after the close of schools in June.

Applicants to be admitted to the course in Domestic Science without examination, must present properly endorsed certificates from such secondary schools as have been accredited or recognized by the University or from approved normal schools or from the State Board of School Examiners, subject to the provisions above stated.

ADMISSION BY EXAMINATION

The Entrance Board will conduct entrance examinations June 14 to 18, and September 6 to 10, 1910. A part of the examinations may be taken in June and the remainder in September. All applicants for admission who cannot conform to the requirements for admission by certificate must take examinations for admission.

SCHEDULE—Examinations will be from 8 to 12 a. m. and from 1 to 5 p. m.

Tuesday,	A. M.	History: Greek and Roman, English, General.
Tuesday,	P. M.	Composition and Rhetoric, Classics, Chemistry, Geology.
Wednesday,	A. M.	Algebra, German, English Grammar, Descriptive Geography.
Wednesday,	P. M.	Plane Geometry, Physical Geography, Arithmetic.
Thursday,	A. M.	Civics, Solid Geometry, Zoology.
Thursday,	P. M.	Beginning Latin, Cæsar, Astronomy, Elements of Agriculture.
Friday,	A. M.	Physics, Physiology, Botany.
Friday,	P. M.	U. S. History, French, English Literature.
Saturday,	A. M.	Vergil, Cicero.

REQUIREMENTS BY UNITS

A unit is the equivalent of a course of study covering a school year of not less than thirty-two weeks with four or five periods a week. To obtain full standing applicants under twenty-one years of age must have credit by examination or certificate for twelve units (and in the course of Domestic Science fifteen units) of which two shall be English, one History, two Mathematics, one Physics, and two foreign language, selected from the following list:

English	3 units
(Foreign students may substitute their native language for the English requirement.)	
American History or American History and Civil Government	1 unit
Ancient History (Greek and Roman) and Medieval History to 814 A. D.....	1 unit
Medieval and Modern History (from 814 A. D. to the present).....	1 unit
(For the present General History may be counted as a unit, but not in addition to Ancient or Medieval and Modern History.)	
English History	1 unit
Algebra (through quadratics).....	1 unit
Algebra (beyond quadratics)	$\frac{1}{2}$ unit
Geometry (plane)	1 unit
Geometry (solid)	$\frac{1}{2}$ unit
Trigonometry	$\frac{1}{2}$ unit
Latin	2, 3, or 4 units
Greek	2, 3, or 4 units
German	2, 3, or 4 units
French	2, 3, or 4 units
Spanish	2, 3, or 4 units
(Not less than two units of any language will be accepted.)	
Physics	1 unit
Chemistry	1 unit
Physical Geography	1 unit

Zoology	1 unit
Botany	1 unit

Physical Geography	} For the present any two of these may be counted together as 1 unit
Zoology	
Botany	
Physiology	

Agriculture	} The Entrance Board may, after investigating each claim, grant a total credit of not to exceed..... 2 units
Free-hand Drawing	
Manual Training	
Domestic Science	

Preparation in excess of the requirement in any subject will not be credited unless it amounts to one-half unit. For a detailed statement of the extent and character of the work required in each subject mentioned above, persons interested should consult a special bulletin, which will be mailed to any address upon request to the University Editor.

No student under twenty-one years of age will be admitted to College if he is conditioned in more than two units. All entrance conditions must be removed within two years after admission.

Students over twenty-one years of age, after obtaining credit for elementary or "grade" work, and for such other subjects as may be necessary to qualify them for the classes that they wish to enter, may, on the presentation of satisfactory reasons, be admitted by the joint action of the Entrance Board and the Executive Committee of the College, to any class in the College, provided that if any student who has been admitted on these conditions afterwards becomes a candidate for a degree, he shall take the omitted entrance examinations at least one academic year before the degree is conferred.

ADMISSION WITH ADVANCED STANDING

Applicants who have completed at least one year's work in an approved college, and who bring official and explicit certificates describing their courses of study and scholarship, and letters of honorable dismissal, will be admitted in accordance with either of two plans:

(1) The entrance units on which the candidate was admitted to the approved college will be accepted at their face value; deficiencies will be made up from the college

credits presented, and advanced credit will be given for any remaining, satisfactory work; or

(2) One year's work will be accepted in lieu of entrance units and the candidates will be admitted without examination and without conditions, but without any advanced standing on the year's work.

Applicants who have completed less than one year's work in an approved college will be given credit for satisfactory work provided they can meet the regular entrance requirements.

REQUIREMENTS FOR SHORT COURSES

No examinations will be required for the two-year courses in Agriculture or Horticulture, but the applicant must be at least seventeen years of age and must satisfy the Entrance Board that he has had practical experience in agriculture or horticulture.

GRADUATE STUDY

Graduates of this College or of other institutions of approved standing may take graduate work in any of the departments of this College. Such students shall elect a major and minor subject and submit to the Graduate Committee of this College an outline of their course of study with the approval of the heads of the departments in which the work is to be taken. Upon the completion of one year's residence, which is devoted wholly to the completion of the course of study approved by the Graduate Committee, and the presentation of an acceptable thesis upon some subject connected with the major elective, the degree of Master of Science in Agriculture will be conferred.

COURSES OF STUDY

AGRICULTURE

The course in Agriculture is one of a number of regular four-year collegiate courses in the University. It is designed not only to make specially trained agriculturists, but also educated men. The course pre-supposes that a young man has had a High School training, or its equivalent, and that he has had the training in farm matters that usually comes to a young man who has lived on a farm. It supplements this training but does not repeat it. The technical training in this course consists of those matters which years of experience in teaching have shown are either lacking or most necessary. Young men from the cities are entering this course, as they should do if they expect to engage in agricultural pursuits, but it should be understood that the course in Agriculture does not, except incidentally, supply that training in farm matters which comes from actual life upon the farm. Such a course could be readily planned, but it would waste the valuable time of nine-tenths of the students who now enter the course.

The officers of the College recognize the danger of a too special or technical training of under-graduate students in a subject having such a wide scope and one requiring for its successful prosecution such breadth of knowledge as agriculture. A careful examination of the course as outlined will show that about one-third of the time of the student during the four years is, or may be, devoted to language (English and foreign), history, and economics, about one-third to pure science, and one-third to technical or professional training. Electives in the junior and senior years allow the student, if he chooses, to specialize in animal husbandry, agronomy, dairying, rural economics, agricultural chemistry, bacteriology, botany, or entomology.

No man or woman is well educated until he or she has

been taught both to do and to think. Both faculties are necessary and each assists the other. Experience and reason, however, show that the students who enter the courses in agriculture have been better trained in doing than in thinking. With them manual training is not as necessary as an educational factor as with students from the cities. However, special emphasis is laid on training the faculties of observation, reason, and judgment. The laboratory methods and facilities are most thorough and complete in all scientific and technical courses, giving a training which is impossible to obtain merely from books.

COURSE IN AGRICULTURE

Degree—Bachelor of Science in Agriculture.

NOTE—The figure in parenthesis following the name of each subject indicates the number of that subject in its department, the other figure the number of credit hours. For full description of the courses, see corresponding numbers under the departments of instruction.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
Chemistry (105 or 109)	4.	Chemistry (106 or 110)	4.
Inorganic.		Qualitative.	
Zoology (101)	3.	Zoology (102)	3.
Invertebrate.		Vertebrate.	
English (101)	2.	English (104)	2.
Paragraph Writing.		Brief Making.	
Animal Husbandry (101)	4.	Animal Husbandry (102)	4.
Cattle and Sheep.		Breeds of Live Stock.	
Drawing (125)	2.	Geology (152)	3.
Shopwork (101)	2.	Shopwork (104)	2.
Cadet Service	1.	Cadet Service	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

FIRST SEMESTER		SECOND SEMESTER	
Geology (153)	3.	Agronomy (104)	4.
Agricultural Chem. (103)	5.	Agricultural Chem. (104)	5.
Botany (101)	4.	Botany (102)	5.
Physiology (101)	3.	Physiology (102)	3.
Zoology (107)	3.	Zoology (108)	3.
Entomology.		Entomology.	
Cadet Service	1.	Cadet Service	1.

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
Agronomy (101)	4.	Agronomy (106)	4.
Dairying (101)	4.	Horticulture (118)	4.
Modern Language	4.	Modern Language	4.
French, German, or Spanish.		French, German, or Spanish.	
Meteorology (101)	2.		

And one of the following:

Animal Husbandry (103)	4.	Animal Husbandry (104)	4.
Breeds of Live Stock.		Dairy Cattle.	
Veterinary Medicine (149)	4.	Veterinary Medicine (150)	3.
Forestry ()	4.	Dairying (102)	4.
Zoology (113)	4.	Zoology (114)	4.
Entomology.		Entomology.	
Bacteriology (107)	4.	Bacteriology (110 or 112)	4.
Agricultural Chem. (*)	4.	Agricultural Chem. (*)	4.
Botany (*)	3 or 4.	Botany (*)	3 or 4.
Agronomy (107)	4.	Agronomy (102)	4.
Animal Husbandry (105)	3.	Animal Husbandry (106)	6.
		Meteorology (102)	2.

FOURTH YEAR

FIRST SEMESTER		SECOND SEMESTER	
American History (101) or		American History (102) or	
Economics (135)	3.	Economics (136)	3.
Rural Economics (103)	4.	Rural Economics (104)	4.
Farm Management.		Agricultural Economics.	

ELECTIVE

Ten hours a week throughout the year from any of the courses given in any of the colleges of the University upon which the student is qualified to enter, except the College of Law. Two hours a week of this elective work may be devoted to a thesis, subject to the consent of the instructor under whom the thesis is to be written.

HORTICULTURE

This course was established to meet a growing demand for special education and training in the College of Agriculture. It seeks to familiarize the student with those sciences that are fundamental in horticulture and to give a certain amount of technical and literary training.

* Students electing Agricultural Chemistry or Botany in their junior year should consult the department interested regarding the same before being registered.

Among the sciences that form the natural basis of a sound, practical knowledge of horticulture are chemistry, physics, botany, geology, zoology, and entomology. To these a large part of the first two years of the course is devoted. In addition, one modern language, rhetoric or English composition, drawing and shopwork are required.

The last two years of the course are devoted mainly to horticulture proper, with some more strictly cultural studies like history or economics. A third part of the required work of the fourth year is elective, and may be chosen from any course in the University upon which the student is qualified to enter.

The primary object of the course is to teach those who desire to become fruit-growers, gardeners, nurserymen, florists, or landscape gardeners, what they most need to know as a foundation for their professional work. To this end both the science and art, or the theory and practice, are taught. While the sciences are invaluable in giving accurate and definite knowledge regarding the origin and growth of plants, and the composition and physical properties of the soil, they cannot tell us just how to select varieties, or how to propagate, transplant, cultivate, fertilize, prune, spray, or what is equally essential in practice, how to harvest, store and market the product to the best advantage.

For earnest, enterprising young men and women, horticulture, in its various branches, offers as large a reward for intelligent, well-directed effort as any other pursuit or profession.

COURSE IN HORTICULTURE

Degree—Bachelor of Science in Horticulture.

NOTE—The figure in parenthesis following the name of each subject indicates the number of that subject in its department; the other figure the number of credit hours. For full description of courses, see corresponding number under the departments of instruction.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
Chemistry (105 or 109) Inorganic.	4.	Chemistry (106 or 110) Qualitative.	4.
Zoology (101) Invertebrate.	3.	Zoology (102) Vertebrate.	3.
English (101) Paragraph Writing.	2.	English (104) Brief Making.	2.
Horticulture (111) Principles.	4.	Horticulture (112) Principles.	4.
Drawing (125)	2.	Geology (152)	3.
Shopwork (101)	2.	Shopwork (104)	2.
Cadet Service	1.	Cadet Service	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

FIRST SEMESTER		SECOND SEMESTER	
Horticulture (103)	3.	Horticulture (104)	3.
Agricultural Chem. (103)	5.	Agricultural Chem. (104)	5.
Geology (153)	3.	Agronomy (104)	4.
Zoology (107) Economic.	3.	Zoology (108) Economic.	3.
Botany (101)	4.	Botany (102)	4.
Cadet Service	1.	Cadet Service	1.

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
Horticulture (105)	4.	Horticulture (106)	4.
Modern Language () French, German, or Spanish.	4.	Modern Language French, German, or Spanish.	4.
Physiology (101)	3.	Physiology (102)	3.
Botany (125)	4.	Botany (126)	4.
Meteorology (101)	1.	Horticulture (108)	3.

FOURTH YEAR

FIRST SEMESTER		SECOND SEMESTER	
American History (101) or		American History (102) or U. S. Political.	
Economics (135)	3.	Economics (136) Political.	3.
Horticulture (109) Ornamental Plants.	3.	Horticulture (110) Home Gardening.	3.
Horticulture (107) Elements of Forestry.	3.	Botany (116) Landscape Gardening.	3.

ELECTIVE

Seven hours a week through the year, chosen from any of the courses given in any college of the University upon which the

student is qualified to enter, except the College of Law, two hours a week of which may be devoted to thesis, subject to the approval of the department in which the thesis is to be written.

COURSE IN FORESTRY

The main objects in the establishment of a four-year course in Forestry are: (1) To educate and train young men in forestry; (2) To promote forestry in the State of Ohio.

The facilities for becoming well grounded in the fundamental and accessory studies are provided in the various departments of the University. Language, mathematics, chemistry, engineering, botany, entomology, etc., form a large part of the work of the first two years of the course, while the last two years are devoted to the more technical subjects.

It is the aim of the department to reach two classes of students: First, those who purpose to make forestry their life work. Second, those who, while specializing in other courses, desire to acquaint themselves with the elements or with certain phases of the general subject.

To those who enjoy outdoor life, and are willing to undergo vigorous tests of mental and physical strength, forestry presents an especially inviting field. The remuneration compares favorably with that of other salaried professions, and the opportunities for private enterprise are wide and varied.

To promote forestry, or the proper use, improvement, and extension of woodlands and forests, the department will do all in its power to bring the subject before the people of the State, and will co-operate with all agencies working to this end.

OUTLINE OF FOUR-YEAR COURSE IN FORESTRY

Degree—Bachelor of Science in Forestry.

NOTE.—The figure in parenthesis following the name of each subject indicates the number of that subject in its department; the

other figure the number of credit hours. For full description of courses, see corresponding number under the departments of instruction.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
Chemistry (105 or 109)	4.	Chemistry (106 or 110)	4.
Mathematics (121)	3.	Mathematics (122)	3.
Modern Language	4.	Modern Language	4.
French, German, or Spanish.		French, German, or Spanish.	
English (101)	2.	English (104)	2.
Engineering Drawing (101)	4.	Forestry (102)	2.
Forestry (101)	2.	Botany (110)	2.
Cadet Service	1.	Cadet Service	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

FIRST SEMESTER		SECOND SEMESTER	
Botany (101)	3.	Botany (102)	3.
Zoology (109)	3.	Zoology (110)	3.
Entomology.		Entomology.	
Modern Language	4.	Modern Language	4.
French, German, or Spanish.		French, German, or Spanish.	
Civil Engineering (121)	6.	Forestry (104)	3.
Surveying.		Arboriculture.	
		Geology (152)	3.
Cadet Service	1.	Cadet Service	1.

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
Forestry (105)	3.	Forestry (106)	3.
Silviculture.		Silviculture.	
Botany (117)	4.	Botany (118)	4.
Geology (153)	3.	Agronomy (104)	4.
Meteorology (101)	2.		

Not less than five hours throughout the year from the following:

Physics (105)	4.	Physics (106)	4.
Agricultural Chem. (103)	5.	Agricultural Chem. (104)	5.
Bacteriology (107)	4.	Bacteriology (110)	4.
Zoology (113)	4.	Zoology (114)	4.
Engineering Drawing ()	2.	Engineering Drawing ()	2.
Economics (135)	3.	Horticulture (108)	3.
Agronomy (107)	4.	Economics (136)	3.

FOURTH YEAR

FIRST SEMESTER		SECOND SEMESTER	
Forestry (107)	4.	Forestry (108)	4.
Mensuration.		Utilization.	
Forestry (109)	4.	Forestry (110)	4.
Management.		Policies.	
Botany (125)	4.	Botany (126)	4.
Physiological Ecology.		Physiological Ecology.	

Not less than five hours throughout the year from any course upon which the student is qualified to enter.

TWO-YEAR COURSE IN AGRICULTURE

The Short Course in Agriculture is a two-year course, designed to give practical instruction in the various branches of agriculture, and is intended primarily for those students whose previous training does not qualify them to enter the four-year course. While believing that the four-year course is none too long for the students who expect to engage in agricultural pursuits, it is recognized that there are many students whose circumstances make it impossible to take a four-year collegiate course in agriculture, and yet who would be greatly benefited by taking a less extended training for their life work.

This course is especially desirable for students of rather mature age. It contains as thorough instruction as the time will admit in agriculture, animal husbandry, dairying, horticulture (including fruit culture, vegetable gardening, and forestry), veterinary medicine, economic entomology, bacteriology, and the sciences underlying these subjects. The second year contains optional work so that it is possible for students to specialize in horticulture, agronomy, animal husbandry, or dairying. The second year also contains a number of elective studies which may be taken as preparatory to the first year of the four-year course in Agriculture.

No degree is given on the completion of the work, but a certificate is issued stating fully the work done.

OUTLINE OF TWO YEAR COURSE IN AGRICULTURE

NOTE.—The figure in parenthesis following the name of each subject indicates the number of that subject in its department; the other figure the number of credit hours. For full description of courses, see corresponding number under the departments of instruction.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
Animal Husbandry (129)	4.	Animal Husbandry (130)	4.
Horticulture (101) Elementary.	4.	Horticulture (102)	4.
Shopwork (101)	2.	Shopwork (104)	2.
Agronomy (103)	4.	Agronomy (108)	4.
Chemistry (101) Elementary.	4.	Chemistry (102) or Agricultural Chem. (102) Soil Fertility.	4.
Cadet Service	1.	Cadet Service	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

FIRST SEMESTER		SECOND SEMESTER	
Agronomy (105)	4.	Rural Economics (102) Crops.	4.
Dairying (101) Elementary.	4.	Dairying (102) Farm Dairying.	4.
Cadet Service	1.	Cadet Service	1.
And two subjects each term chosen from the following:			
Veterinary Medicine (149)	4.	Veterinary Medicine (150)	4.
Animal Husbandry (123) Dairy Cattle.	4.	Animal Husbandry (128) Stock Breeding.	4.
Horticulture (113) Pomology.	4.	Horticulture (114) Pomology.	4.
Zoology (109) Entomology.	4.	Zoology (110) Entomology.	4.
Physiology (103)	3.	Bacteriology (104)	3.
Mathematics (103) Algebra.	5.	Mathematics (104)	5.
Physics (101)	6.	Botany (102) Elementary.	4.
Forestry ()	4.	Geology (102) Physical Geography.	4.

TWO-YEAR COURSE IN HORTICULTURE

This course is intended to be to those engaged in horticultural pursuits what the two-year course in agriculture is to those interested in farming. Practical instruction will

be given in the subjects which are of interest to the fruit-growers, gardeners, nurserymen, florists, and landscape gardeners. The course is primarily for the student, who, for various reasons, cannot take the four-year course in Horticulture and yet desires to have somewhat thorough preparation in the fundamentals of horticulture.

No degree is given on completion of the work but a certificate is issued stating fully the work done.

OUTLINE OF TWO-YEAR COURSE IN HORTICULTURE

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
Horticulture (101)	4.	Horticulture (102)	4.
Zoology (109)	4.	Zoology (110)	4.
Entomology.		Entomology.	
Shopwork (101)	2.	Shopwork (104)	2.
Chemistry (101)	4.	Chemistry (102) or	
Elementary.		Agricultural Chem. (102)	4.
		Soil Fertility.	
Agronomy (103)	4.	Botany (112)	4.
Cadet Service	1.	Cadet Service	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

FIRST SEMESTER		SECOND SEMESTER	
Horticulture (113)	4.	Horticulture (114)	4.
Pomology.		Pomology.	
Horticulture (115)	4.	Horticulture (116)	4.
Agronomy (105)	4.	Rural Economics (104)	4.
Equipment.		Crops.	
Cadet Service	1.	Cadet Service	1.
One of the following:			
Forestry	4.	Horticulture	4.
Mathematics (103)	5.	Mathematics (104)	5.
Algebra.		Bacteriology (104)	3.
Physics (101)	5.	Geology (102)	4.
Physiology (103)	3.	Physical Geography.	

WINTER COURSES

THE OHIO DAIRY SCHOOL

This course in Dairying is established to meet the wants of those who have neither the time nor means for

more extended courses. It is designed especially for those who are desirous of mastering the art of butter and cheese making or who wish to become fitted for the position of manager or superintendent of a creamery or cheese factory. In this course the greater part of the time is given to the laboratory or dairy room practice. This consists in the testing of milk as to purity and content of butter fat; the use and care of centrifugal separators and other dairy devices; the making of butter and cheese by the most improved methods; in short, all the essential operations of the creamery, factory, and home dairy management are repeatedly performed under the guidance and direction of competent instructors. A special bulletin describing this course will be mailed upon application to any one interested.

WINTER COURSE IN AGRICULTURE

The ten weeks Winter Course in Agriculture has been established to meet the demands of those Ohio farmers who are unable to avail themselves of the other courses in agriculture offered by the University. There is a large number of young men located on the farms of our state who are so situated that it is impossible for them to be absent from their homes during the nine months of the college year, but yet desire some training in the principles of agriculture. On other farms are found mature men who are past the usual school age but are ambitious to become familiar with the most recent agricultural thought and practices.

This course offers to such men an opportunity to become familiar with the results of the latest investigation in agriculture and to study the theories resulting from his research and their practical application to work on the farm.

Those interested are invited to write for the special announcement describing this course.

DOMESTIC SCIENCE

The course in domestic science is planned to meet the special needs of women students. Four years of regular university work are required. The department of Domestic Science stands for a liberal training of a university grade, which gives a homeward trend to the education of young women.

The course is essentially scientific in character, but a fair amount of literary, artistic, and economic training is provided. Certain courses offered in this department are electives for students who specialize along other lines of work. The prescribed course affords opportunity for a student to specialize in domestic science, and elective courses in addition to this provide training for those who wish to teach the subject. Students desiring to enter this course will be required to present fifteen units entrance requirements.

OUTLINE OF COURSE IN DOMESTIC SCIENCE

Degree—Bachelor of Science in Domestic Science.

NOTE.—The figure in parenthesis following the name of each subject indicates the number of that subject in its department; the other figure the number of credit hours. For full description of courses, see corresponding number under the departments of instruction.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
Chemistry (105 or 109)	4.	Chemistry (106 or 110)	4.
Art (101)	2.	Art (102)	2.
English (101)	2.	English (104)	2.
Zoology (101) or		Zoology (102) or	
Botany (101)	3 or 4.	Botany (102)	3 or 4.
Modern Language ()	4.	Modern Language ()	4.
French, or German.		French, or German.	
Domestic Art (101)	2.	Domestic Art (102)	2.
Hand Craft.		Textiles.	
Physical Training	1.	Physical Training	1.

SECOND YEAR

FIRST SEMESTER		SECOND SEMESTER	
Chemistry (127) Organic.	5.	Economics (138)	5.
Domestic Science (101)	4.	Domestic Science (102)	4.
Physiology (101)	3.	Physiology (102)	3.
Modern Language French, or German.	4.	Modern Language French, or German.	4.
Engineering Drawing (127) 1½.		Engineering Drawing (128) 1½.	
Physical Training	1.	Physical Training	1.

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
Sociology (101)	3.	Sociology (102)	3.
GROUP A			
Bacteriology (107)	3 to 5.	Domestic Science (104)	3.
Agricultural Chem. (123)	5.	Agricultural Chem. (124)	5.
GROUP B			
Art (105)	2.	Art (106)	2.
Domestic Art (103)	3.	Domestic Art (104)	3.

Either Group A or Group B may be chosen; one must be taken and both may be. Enough work must be elected with Group A or Group B to make fifteen hours.

FOURTH YEAR

FIRST SEMESTER		SECOND SEMESTER	
GROUP A			
Domestic Science (105)	2.	Domestic Science (106)	3 to 5.
Domestic Science (103)	4.		
Domestic Science (107)	3.		
GROUP B			
Philosophy (183)	2.	Philosophy (184)	2.
Art (119)	1.	Art (120)	1.

Enough work must be taken with group A or group B, or both, to total not less than 15 hours.

DEPARTMENTS OF INSTRUCTION

AGRICULTURAL CHEMISTRY

(Townshend Hall)

PROFESSOR VIVIAN, PROFESSOR WEBER, ASSOCIATE PROFESSOR LYMAN,
MR. BEAR, MR. B. M. HENDRIX, MR. E. W. BENNAGE, MR. GEO. E. BOLTZ

The department of Agricultural Chemistry occupies the greater part of the second floor of Townshend Hall. The main students' laboratory is at present fitted up with one hundred and fifty desks, and will accommodate over two hundred students. Each desk contains a complete outfit of apparatus and chemicals necessary for the work in hand. Special apparatus and chemicals are supplied from the store room. Each desk is supplied with gas and water. Hoods for evaporation and generation of noxious gases and liquids are conveniently arranged on both sides and one end of the laboratory. From the main laboratory, easy access is had to the balance room and private laboratory of the instructor on one side and to the organic analysis and assistant's room and store room on the other. A room entirely detached from the main laboratory is fitted up for water analysis and for the polariscopic determination of sugar. The lecture room is capable of seating one hundred and fifty students. In connection with it is a preparation room, which is supplied with the necessary apparatus and specimens for illustrating the lectures.

Equivalent term courses: 102=16; 103-104=13; 105-106=17; 107-108=19; 109-110=20; 111-112=23; 121-122=18; 123-124=14; 125-126=21; 131-132=22.

102. APPLICATION OF CHEMISTRY TO AGRICULTURE. Four credit hours. Second semester. Short courses in Agriculture and Horticulture. Professor VIVIAN.

Lectures and recitations embrace the following topics: Ingredients of plants, organic and inorganic, essential and non-essential; sources of plant food, air and soil; nature of soil, mechanical portion, nutritive portion, assimilable and reserve plant food; soil ex-

haustion and amelioration; barnyard manure, its sources, composition, and preservation; commercial fertilizers, their rational use; methods of determining the needs of soils.

103-104. GENERAL AGRICULTURAL CHEMISTRY. Five credit hours. The year. Four-year courses in Agriculture, Horticulture, and Forestry. Prerequisite, Chemistry 106 or 110. Professor VIVIAN, Mr. BEAR, Mr. HENDRIX, Mr. BENNAGE Mr. BOLTZ.

Three lectures and two laboratory periods weekly. Lectures on chemistry as applied to agriculture, including the following topics: Food requirements of plants, sources of plant food, soil exhaustion and amelioration, barnyard manures and commercial fertilizers, composition of feeding stuffs and dairy products. Laboratory work consists of a brief introduction to quantitative analysis, gravimetric and volumetric, followed by the analysis of fertilizers, feeding stuffs, and dairy products.

105-106. ADVANCED AGRICULTURAL ANALYSIS. Five credit hours. The year. Prerequisite, 103-104. Professors WEBER and VIVIAN, Mr. BEAR and Mr. HENDRIX.

The work of this course consists of a detailed study of the official methods of determining nitrogen, potash, phosphoric acid; the complete analysis of grains and feeding stuffs, milk, butter, and cheese. Intended for students desiring to specialize in agricultural chemistry.

107-108. DAIRY CHEMISTRY. Three to five credit hours. The year. Prerequisite, 103-104. Time to be arranged. Professors VIVIAN and WEBER.

Lectures on the composition of milk and its products; fermentation, digestion, and decomposition of milk. Laboratory practice on the complete analysis of milk, butter, and cheese; determination of the chemical and physical constants of butter fat; determination of the different proteids of milk and a study of their cleavage products; effect of treatment of dairy products on their chemical composition as shown by analysis, etc. Intended for students specializing in dairying and should be accompanied or preceded by a course in dairying.

109-110. CHEMISTRY OF SOILS. Three to five credit hours. The year. For students specializing in agronomy. Prerequisite, Course 103-104. Time to be arranged. Professors WEBER and VIVIAN.

Lectures and laboratory work on the chemical composition of the soil, using the official method of analysis of soils, and the various methods suggested by the U. S. Department of Agriculture; testing needs of soils for application of commercial fertilizers.

111-112. CHEMISTRY OF ANIMAL NUTRITION. Three to five credit hours. The year. Prerequisites, 103-104 or equivalent. Time to be arranged. Professor VIVIAN.

For students specializing in animal husbandry.

121-122. FOOD INSPECTION AND ANALYSIS. Three to five credit hours. The year. Prerequisite, 103-104 or an equivalent preparation in quantitative analysis. Professor WEBER, Associate Professor LYMAN.

Lectures on composition of foods and food adulteration. Laboratory practice embraces the analysis of foods, tea, coffee, syrups, spices, condiments, flavoring extracts, baking powder; sanitary analysis of water; analysis of fats and oils, etc., and the examination of the same for adulteration. This course is designed to prepare for the analytical work connected with the state control of the sale of food stuffs, etc.

123-124. DOMESTIC SCIENCE CHEMISTRY. Five credit hours. Course in Domestic Science. The year. Prerequisite, Chemistry 106 and 127. Associate Professor LYMAN and assistants.

Lectures on household chemistry. Laboratory work consists of a brief introduction to quantitative analysis, followed by the analysis of foods and other materials of household interest.

125-126. ADVANCED HOUSEHOLD CHEMISTRY. Three to five credit hours. The year. Prerequisite, 123, 124. Second and third semesters, time to be arranged. Professor WEBER and Associate Professor LYMAN.

A study of the composition and analysis of foods; the chemistry of cookery and changes during cooking, as shown by analysis; the examination of cleaning materials, baking powders, the sanitary analysis of water, etc.

131-132. RESEARCH WORK. Five to ten credit hours. The year. Time to be arranged. Professors WEBER and VIVIAN, and Associate Professor LYMAN.

(Courses 105 to 112 and 125 to 132 may be taken as graduate work if not previously elected, or continued as special lines of research during a graduate course. Major graduate work may be taken along these or other lines included in Agricultural Chemistry.)

AGRONOMY
(Townshend Hall)

PROFESSOR MC CALL, ASSOCIATE PROFESSOR———, ASSISTANT
PROFESSOR RAMSGWER, ASSISTANT PROFESSOR WAID.

For the work in farm equipment and rural engineering, the department is supplied with apparatus for studying the effect of grade, height of obstruction, height of hitch, size of wheel, and weight of load on the draft of wagons. Correct and incorrect methods of constructing and using the double-tree are studied by means of a large, adjustable model. The draft of vehicles and farm implements is studied by means of a self-registering dynamometer. The agricultural machinery room contains many of the latest models of farm machinery, including binders, mowers, plows, cultivators, and gasoline engines. Several drainage levels and an architect's level are provided for the student's use in running levels and laying out drainage systems. A plane table is used for mapping and laying out fields. A small cement laboratory provides facilities for studying the use of cement and concrete on the farm. A large glass house with its equipment of railroad tracks, trucks, and pots affords opportunity for the study of the adaptability of crops to soils, the fertilizer requirements of different soils and various other problems of crop production. The soils laboratory is provided with apparatus for study of the physical properties of soils, including specific gravity, the retention of moisture, the effect of mulches on evaporation, the rate of percolation of water through soils, and the capillary rise of moisture in soils. The laboratory is also provided with a complete centrifugal outfit for the mechanical analysis of soils, and electrical instruments for determining temperature and soluble salt content.

In the study of crops use is made of a large collection of seeds, of dried specimens of grasses, grains, and other crops, and the growing crops on the farm. For the corn judging

work samples are secured of all the chief varieties grown in different sections of the corn belt, and opportunity is offered in the advanced courses to assist in judging at local corn shows. The market grades of grain and hay are studied by commercial samples secured from the chief markets of these crops. The department is supplied with Brown-Duval testers and ovens for the study of the moisture content of field crops in different stages of curing and under different processes of storage.

The variety test plots include all the principal Ohio varieties of corn, wheat, oats, barley, flax, sorghum, millet, soy beans, and cow peas, and the different species of grasses and legumes used for pastures and meadows, all grown side by side, so that a comparative study may be made as to the value of each. Breeding plots of corn, wheat, alfalfa, clover, and timothy are maintained to give opportunity for the study of variation, correlation, selection, and other principles of plant breeding as well as the practical methods of crop improvement.

Equivalent term courses: 101=2; 102=4; 104=12; 105=11; 107=16; 106=22; 109=23; 111=27; 110=24; 113=26; 115-116=28; 117-118=29; 119-120=30.

101. FARM EQUIPMENT. Four credit hours. First semester. Prerequisite, Engineering Drawing 125. Assistant Professor RAMSOWER.

Lectures and recitations on the laying out and equipment of the farm, the planning of farm buildings, and a general study of farm power, water supply, and farm machinery. Practicum in the laying out of farms, the planning of farm buildings, comparison of farm machines, and in the working out of problems in farm mechanics.

103. FARM EQUIPMENT. Four credit hours. First semester. Two-year courses in Agriculture and Horticulture. Assistant Professor RAMSOWER.

Lectures and practice covering the laying out and the equipment of the farm, the planning of buildings, and a detailed study of farm power, machinery, water supply, and drainage.

102. AGRICULTURAL ENGINEERING. Four credit hours. Second semester. Prerequisite, Agronomy 101. Assistant Professor RAMSOWER.

Lectures, recitations, and practicums on (a) the survey and measurement of fields and lots; (b) farm construction, including a study of timber, brick, cement, and other materials; (c) the laying out and construction of roads and drainage systems.

105. ELEMENTARY SOILS. Four credit hours. First semester. Two-year courses in Agriculture and Horticulture. Professor McCALL.

Lectures and recitations on the formation and physical properties of our agricultural soils, with special reference to methods of management and improvement. Practicum in the laboratory for the study of the relation of soils to air, heat, moisture, and fertilizers.

104. ELEMENTARY SOILS. Four credit hours. Second semester. Four-year courses in Agriculture, Horticulture, and Forestry. Professor McCALL.

Lectures and recitations on the origin, formation, and kinds of soil, their chemical and physical composition, and improvement by cultivation, fertilization, drainage, and irrigation. Laboratory studies of the physical properties of soils, and the factors which control soil fertility.

107. ADVANCED SOILS. Four credit hours. First semester. Prerequisite, Agronomy 104 or 105. Professor McCALL.

Lectures on (a) the general character and the distribution of the more important soil types of the United States and their adaptability to crops, (b) the factors underlying soil fertility, with special reference to the effect of different methods of cultivation and cropping. The lectures will be supplemented by field trips for the identification and mapping of soil types and by laboratory work, which will include the mechanical analysis of soils and a study of their physical behavior.

106. FIELD CROP PRODUCTION. Four credit hours. Second semester. Prerequisite, Botany 101 or its equivalent. Associate Professor ———.

A study of the history, adaptation, distribution, and classification of the cereal crops, and the cultivation, harvesting, and marketing of the same throughout the great agricultural sections of the world, with special attention given to Ohio conditions.

108. CROP PRODUCTION. Four credit hours. Second semester. Two-year course in Agriculture.

A study of the cultivation, harvesting, and utilization of the principal cereal and forage crops of the United States, with special reference to Ohio conditions.

109. SEED AND MARKET GRAIN. Two credit hours. First semester. Prerequisite, Agronomy 106. Associate Professor ———

Seed selection; corn and small grain judging, and the market grading of grains.

111. GRASSES AND FORAGE CROPS. Three credit hours. First semester. Prerequisite, Botany 101 or its equivalent. Associate Professor ———.

The study of the history, distribution, adaptation, characteristics, cultivation, harvesting, and marketing of the principal forage crops, including the grasses and legumes used for pastures and meadows, annual forage crops, soiling, and silo crops. Laboratory work in the study of methods and preparing the seed bed, root systems of forage plants, root nodules and inoculation of legumes, moisture content of forage crops, comparison of silage methods, comparative study of annual forage crops, and seed testing for purity and germination.

110. AGRICULTURAL EXPERIMENTATION. Four credit hours. Second semester. Lecture arranged. Professor McCall.

Lectures upon history and development of experiment stations, methods, and character of station work, and the interpretation of experimental results. Seminars devoted to the study of experiment station literature, and to the methods of experimentation.

113. FIELD CROP IMPROVEMENT. Three credit hours. First semester. Prerequisite, Agronomy 106. Associate Professor ———.

A study of the principles involved and the methods used in the improvement of field crops.

GRADUATE WORK

Special work in soils, or crops, will be arranged for students desiring to take a graduate course in agronomy. Graduate students taking this work will be given an opportunity to prepare for work in the United States Department of Agriculture and for college and experiment station positions.

115-116. ADVANCED CROP PRODUCTION. Five to ten credit hours. The year.

Research and monograph work in one or more of the cereal or forage crops.

117-118. ADVANCED CROP IMPROVEMENT. Five to ten credit hours. The year.

Research work in plant breeding, the study of plant breeding experiments at the University and at the State Experiment Station,

and the investigation of crop improvement work in other states and countries.

119-120. RESEARCH WORK IN SOILS. Five to ten credit hours. The year.

The preparation of monographs and special laboratory or field work on topics connected with the subject of soils, including (a) methods of surveying and mapping, (b) the relation of soil types to crop production, and (c) the influence of certain physical properties upon crop production.

AMERICAN HISTORY

(Office, Room 207, University Hall)

PROFESSOR KNIGHT, ASSOCIATE PROFESSOR HOCKETT

Equivalent term course: 101-102=1.

101-102. POLITICAL HISTORY OF THE UNITED STATES. Three credit hours. The year. Professor KNIGHT, Associate Professor HOCKETT, Assistant Professor SHEPARD.

An outline course covering the period 1600-1900, considering political, economic, and personal aspects of American history from the origins to the present day. The *Epochs* series, by Thwaites, Hart, and Wilson, and MacDonald's *Documentary Source Book of American History*, will be used as text-books, supplemented by outside reading in the works of Fiske, the *American Statesmen* series, and the *American Nation* series. Recitations and reports.

ANATOMY AND PHYSIOLOGY

(Biological Hall, Rooms 12 and 20)

PROFESSOR BLEILE, ASSOCIATE PROFESSOR SEYMOUR, MR. FEIEL

The facilities provided for the study of anatomy, histology, and physiology are good. The laboratory is supplied with skeletons, manikin, and many models of the organs of the body. The apparatus for work in physiology is of good construction and adequate for the performance of fundamental physiological experiments.

For work in histology the equipment includes sixty individual tables for student work, each one being supplied with a good microscope and the various accessories. The

equipment of the laboratories makes it possible to offer work along certain lines to advanced students.

Equivalent term courses: 101-102=1; 103=2; 104=3.

101-102. HUMAN ANATOMY AND PHYSIOLOGY. Three credit hours. The year. This course must be preceded or accompanied by a course in chemistry. Professor BLEILE, Associate Professor SEYMOUR.

103. GENERAL PHYSIOLOGY. Three credit hours. First semester. Short course in Agriculture. Professor DURRANT.

104. CHEMICAL PHYSIOLOGY. Three credit hours. Second semester. Professor BLEILE.

ANIMAL HUSBANDRY

(Live Stock Pavilion)

PROFESSOR PLUMB, PROFESSOR MARSHALL, MR. SHIELDS, MR. VAUGHAN

The University herd contains a large number of very high class, valuable animals. These include excellent specimens for class room work of pure bred Shorthorn, Aberdeen Angus, Jersey, Guernsey, Holstein-Freisian, Kerry, and Red Polled cattle, and a variety of grade and pure bred beef steers. Good specimens of Merino, Southdown, Shropshire, and Cotswold sheep, and Berkshire, Poland China, Duroc-Jersey, and large Yorkshire swine are also kept. For years the department has shown specimens of the University stock at the International Live Stock Exposition, where numerous valuable prizes have been won. These show animals are extensively used in the judging work of the students. The University owns some choice pure bred Percheron, Clydesdale, and Hackney mares, and good specimens of work horses. In addition to this, at convenient distances are famous studs of imported Percheron, French Coach, German Coach, and Belgian horses. Students are conducted to Columbus stables containing large numbers of horses, and to stock farms about Columbus and in neighboring counties, where methods of feeding and handling

may be studied and animals inspected. Each year a class of students attends the International Live Stock Exposition at Chicago in charge of instructors, spending a few days among the stock exhibits, the Union stock yards, and packing houses. Class room facilities in animal husbandry are of a very high order. The judging pavilion for live stock is a beautiful brick structure with a large room 112 feet long, with tan bark floor, on which stock may be shown to the very best advantage. This building, with the new cattle and horse barns, all constructed in 1907 at a cost of \$80,000, gives the University the very finest of facilities for teaching Animal Husbandry. As additional facilities for instruction, the University has a very superior collection of herd, flock and stud books of the various American and European breeding associations, these being used in laboratory work in the Principles of Breeding. There is also a large collection of lantern slides of breeds and types of animals, various instruments for measuring and studying stock, specimens of feeding stuffs, wools, and other animal products.

FOUR-YEAR COURSE

Equivalent term courses: 103=2; 104=4; 106=6; 105=8; 108=10; 107=12; 112=14; 109=19; 110=20; 114=22; 101=23; 102=24; 116=26; 129-130=1; 128=3, 5; 123=25.

103. BREEDS OF HORSES AND SHEEP.. Four credit hours. First semester. Professor PLUMB, Professor MARSHALL.

Lectures, text-book, and recitations upon the history, development, characteristics, and adaptations of types and breeds of horses and sheep. Laboratory work includes judging types and breeds of horses and sheep one afternoon a week and occasional inspection trips to herds in the state.

104. BREEDS OF CATTLE AND SWINE. Four credit hours. Second semester. Professor PLUMB, Professor MARSHALL.

Covers the subjects of cattle and swine on the same basis as Course 103.

106. PRINCIPLES OF BREEDING. Four credit hours. Second semester. Professor MARSHALL.

Lectures, text-books, and recitations upon the subjects of hered-

ity from various points of view in its application to breeding farm animals. Library research is required, and for laboratory work one afternoon a week is devoted to studying pedigree construction, and working out problems in heredity from herd books. Students taking this course should have had either course 103 or 104, and preferably both. Also the course in Zoology in the Freshman year.

105. FEEDING ANIMALS. Four credit hours. First semester. Professor VIVIAN, Professor PLUMB.

A consideration of the laws of nutrition, the character and composition of feed stuffs and methods of feeding different kinds of farm animals under varying conditions. Work to a reasonable extent is required of students in calculating rations and in studying rations in practical use in the community and suggesting improvements if desirable. The economy of the subject is carefully considered. Professor Vivian has charge of the class the first part of the semester on the subject of the chemistry of foods and nutrition, Professor Plumb taking the balance of the semester in a discussion of practical feeding problems.

108. HYGIENE AND MANAGEMENT. Four credit hours. Second semester. Professor MARSHALL. This course should be preceded by 105 and 106.

A series of lectures on the sanitation of the stable, on conditions of health surrounding stock in general, and a discussion of the approved methods to be used in the production of horses, cattle, sheep, and swine.

107. ANIMAL CONFORMATION AND STOCK JUDGING. Four credit hours. First semester. Professor MARSHALL and Mr. VAUGHAN.

This is an advanced class for students who have already had the work of the Junior year in Courses 103 and 104. The purpose is to give a more detailed consideration to type and breed conformation, with an emphasis on practice in judging groups and classes and rendering required reasons therefor. Only students who have generally covered the first three years of judging work are expected to take this course.

112. LIVE STOCK MARKETING AND COMMERCE. Four credit hours. Second semester. Professor PLUMB.

A discussion of the purposes and work of live stock markets, methods of sale and shipment, the practices of the live stock markets and yards, the market classifications and grading, the export and import trade, etc. Considerable library work is required in this subject, studying comparative market reports and market develop-

ment. Visits are also made to stock yards, transportation agencies, packing houses, etc.

109. HORSE TRAINING. THE HARNESS AND VEHICLE. Two credit hours. First semester. *Tu., Th., at 9.* Professor MARSHALL.

A study of equine intelligence and the training and development of the horse to the purposes of man. This also includes the study of methods of riding and driving, etc. The second half of the first semester to a more less degree is devoted to a study of the harness and vehicle, their history and development, construction and adaptability to various uses in connection with the horse.

110. MEATS AND MEAT PRODUCTS. One credit hour. Second semester. Professor PLUMB.

Methods of slaughter of farm animals, the preparation of the carcass, and the various cuts and products derived therefrom.

114. BIOGRAPHICAL STUDIES OF MASTER BREEDERS. One credit hour. Second semester. Time to be arranged. Professor PLUMB.

A series of lectures discussing the lives and methods of famous master breeders of live stock.

101. TYPES AND CLASSES OF CATTLE AND SHEEP. Four credit hours. First semester. Mr. VAUGHAN.

A discussion of the various types of cattle and sheep and the market classes. Judging work will include specimens of the various types and classes judged by score card, comparison, etc.

102. TYPES AND CLASSES OF HORSES AND SWINE. Four credit hours. Second semester. Professor MARSHALL, Mr. VAUGHAN.

A discussion of the various types and classes and grades of horses and swine. Judging work will include score card and comparative studying of individuals and groups.

116. DAIRY CATTLE. Four credit hours. Second semester. Professor PLUMB, Mr. SHIELDS,

The different breeds of dairy cattle will be studied, a limited amount of score card work conducted, and considerable judging by comparison in group method. Dairy herds in the vicinity of Columbus will also be visited as conditions will permit.

TWO-YEAR COURSE

129-130. TYPES AND BREEDS OF LIVE STOCK. Four credit hours. The year. Mr. SHIELDS and Mr. VAUGHN.

Text-book and discussion on the history, characteristics, adaptability, economic value, etc., of types and breeds of live stock. Practical work in judging one afternoon a week, both score card and comparative group work being used.

128. FEEDING AND BREEDING OF ANIMALS. Three credit hours. Second semester. Mr. VAUGHAN.

A study of the principles of nutrition, character and composition of feed stuffs, and methods of feeding different kinds of farm animals under various conditions occupies the first half of the semester. The second half is given to the principles of breeding, text-book, lectures, and recitations being required. Pedigree study and problems in heredity occupy the laboratory period.

123. DAIRY CATTLE. Four credit hours. First semester. Laboratory to be arranged. Professor PLUMB, Mr. SHIELDS.

Text-book and discussion of the history, characteristics, economic value, etc., of breeds of dairy cattle. Practical work in judging one afternoon a week, various methods being used. Herds of cattle in the vicinity will be visited.

GRADUATE WORK IN ANIMAL HUSBANDRY will be provided in this department to suit the needs of the student, under the general rules of the University for this work. Special facilities, however, will be furnished in any one of the following, selected as a major subject in connection with a minor study pursued in another department: (a) Breed, history, and development; (b) animal nutrition; (c) heredity in its application to the horse; (d) the education and training of the horse; (e) wool and its uses; (f) live stock registration; (g) live stock markets; (h) live stock judging.

These are offered as lines of special study under departmental direction. Special investigational facilities are at hand, in the use of the University stables, the laboratory in agricultural chemistry, the extensive library of works on animal husbandry, the large stables in and about Columbus, etc. No animal husbandry department in America has at its disposal a more comprehensive supply of material for the student of the horse.

ARCHITECTURE

(Office, Brown Hall)

PROFESSOR BRADFORD, ASSOCIATE PROFESSOR CHUBB, MR. HASKETT

Equivalent term courses: 101-102=9, 10, 11.

101-102. HISTORY OF ARCHITECTURE. Three credit hours. The year. Lectures illustrated by lantern slides. Professor BRADFORD.

ART

(Office, Hayes Hall)

ASSISTANT PROFESSOR TITSWORTH, MISS FINNEY

Equivalent term courses: 101-102=10, 11, 12; 105-106=13, 14, 15.

101-102. DESIGN AND COMPOSITION. Two credit hours. The year. Assistant Professor TITSWORTH, MISS FINNEY.

This course is designed to develop appreciation of harmony of line, space, and color. It brings into play the creative imagination and establishes a basis for critical judgment along all art lines. Nature motives used. Study of color, theory, and harmony. Medium: Pencil, ink, charcoal, and water color.

105-106. DESIGN AND COMPOSITION. Two credit hours. The year. Prerequisite, Course 102. Miss FINNEY.

Continuation of Art 102 with advanced problems in color and line as applied to decoration.

BACTERIOLOGY

(Office, Veterinary Laboratory Building)

PROFESSOR MORREY, ASSOCIATE PROFESSOR McCAMPBELL, MR. GEORGE

These courses in Bacteriology are open to advanced undergraduate and graduate students only. The instructor in charge must be consulted before electing.

Equivalent term courses: 107=5; 108=7; 110=8; 112=9; 121-122=13; 123-124=14; 104=2.

107. GENERAL BACTERIOLOGY. Three to five credit hours. First semester. Professor MORREY, Associate Professor McCAMPBELL.

108. PATHOGENIC BACTERIOLOGY. Three to five credit hours. Second semester. Prerequisite, Course 107. Professor MORREY, Associate Professor McCAMPBELL.

*110. DAIRY BACTERIOLOGY. Three to five credit hours. Second semester. Prerequisite, Course 107. Professor MORREY.

*112. SOIL BACTERIOLOGY. Three to five credit hours. Second semester. Prerequisite, Course 107. Professor MORREY.

*121-122. ADVANCED DAIRY BACTERIOLOGY. Three to five credit hours. The year. Prerequisites, Courses 107 and 110, or equivalents. Professor MORREY.

*123-124. ADVANCED SOIL BACTERIOLOGY. Three to five credit

hours. The year. Prerequisites, Courses 107 and 112, or equivalents. Professor MORREY.

*104. AGRICULTURAL BACTERIOLOGY. Three credit hours. Second semester. For two-year courses in Agriculture and Horticulture. Associate Professor McCAMPBELL.

BOTANY

(Office, Botanical Hall)

ASSOCIATE PROFESSOR SCHAFFNER, ASSISTANT PROFESSOR GRIGGS, ASSISTANT PROFESSOR DACHNOWSKI, MISS DETMERS

The department offers good facilities for instruction and investigation. A large number of charts and mounted specimens are among the appliances for daily class work. The museum contains a large amount of illustrative material; the native medicinal plants and the collection of Ohio woods being very complete. The State herbarium consists of between fifteen and twenty thousand sheets of Ohio plants. The laboratory is well equipped with dissecting and compound microscopes, also the usual appliances for doing both elementary and advanced morphological and physiological work. The green house attached to the Botanical building is an important adjunct to the department, furnishing much fresh material for laboratory use. It is also used as a laboratory to carry on special work when growing plants are used.

Equivalent term courses: 101-102=6, 7, 8; 110=9; 112=1; 116=11; 117-118=17; 125-126=24.

101-102. GENERAL BOTANY. Four credit hours. The year. Text-books, Curtis' Nature and Development of Plants, Schaffner's Laboratory Outlines for General Botany (2d edition). Assistant Professor GRIGGS.

This course is a general survey of the plant kingdom by the method of types. It is intended to give a general view of the evolution of plants from the lowest to the highest.

110. DENDROLOGY. Two credit hours. Second semester. Text-

* Not given in 1910-1911.

book, Schaffner's Trees of Ohio and Surrounding Territory. Associate Professor SCHAFFNER.

A study of the local trees and shrubs. Students are required to prepare a dendrological herbarium.

112. ELEMENTARY BOTANY. Four credit hours. Second semester. Text-books, Coulter's A Text-Book of Botany, and Kellerman's Spring Flora (New edition). Miss DETMERS.

This is a general elementary course. It comprises mostly organography and plant physiology and a study of the native flora, but some instruction is also given in ecology and classification. The students are required to do some work in the field both in observation and collecting.

This course cannot be used for University credit.

116. PLANT PATHOLOGY. Three credit hours. Second semester. Prerequisite, Botany 101-102, or equivalent. Text-book, Druggar's Fungous Diseases of Plants. Assistant Professor GRIGG.

The diseases of plants due to physical causes and animals are briefly considered, but the main part of the course is devoted to a study of the parasitic fungi most destructive to cultivate plants. Each student takes some economic subject or group of parasites for special study and is required to prepare a complete report on the same.

117-118. FOREST BOTANY. Four credit hours. The year. Prerequisite, Botany 101-102 or equivalent. Assistant Professor DACHNOWSKI.

It includes a study of native and introduced trees and the preparation of a dendrological herbarium; attention is given to the determination of trees by means of leaf and twig characters. This is followed by a study of the development of woods, characters of coniferous, hard, and soft woods and changes due to attacks of fungi. The students are required to prepare a series of gross and microscopic sections. In the spring a study is made of the genetic development of local forests, as well as other ecologic conditions, and a general consideration of fungi injurious to trees and wood.

125-126. PLANT PHYSIOLOGY. Four credit hours. The year. Laboratory and field work. Prerequisite, Botany 101-102, or equivalent. Assistant Professor DACHNOWSKI.

The course is an experimental study of the soil, air, and biotic relations of plants. It aims to give training and instruction in such phases of nutrition, growth, movement, and the tropisms of plants as have a practical bearing in agriculture, forestry, and general biology.

CHEMISTRY

(Office, Chemistry Hall)

PROFESSOR MC PHERSON, ASSOCIATE PROFESSORS EVANS AND WITHROW,
DEPARTMENT ASSISTANTS

The laboratories of the department accommodate over one thousand students. Each laboratory is equipped with all necessary conveniences—water, gas, electric lights, distilled water piped from a large still in the attic, steam ovens, automatic air blasts, suction pumps, etc. The department is liberally supplied with the best apparatus and materials for both lecture room and laboratory work. Each student has his own desk with drawers and locker. All supplies are procured from the chemical store room, which has always on hand a complete stock of all necessary materials.

Equivalent term courses: 101-102=3, 45; 105, 106=7; 12; 109, 110=44, 12; 127=34; 151-152=46; 153-154=47.

101. ELEMENTARY CHEMISTRY. Four credit hours. First semester. One lecture, one quiz, six hours laboratory work weekly. Associate Professor EVANS, Mr. STRATTON.

A general introductory course on the chemistry of the non-metals. It is distinctly elementary in character and is arranged for students in short courses only. No credit is allowed for it in the regular four-year courses. Students taking this course should follow with Course 102, second semester.

102. ELEMENTARY CHEMISTRY AND QUALITATIVE ANALYSIS. Four credit hours. Second semester. One lecture, one quiz, six hours laboratory work weekly. Prerequisite, 101. Associate Professor EVANS, Mr. WITZEMANN.

A general introductory course on the chemistry of the metals. The laboratory work deals with the elementary principles of qualitative analysis. The course is arranged for students in short courses only. No credit is allowed for it in the regular four-year courses.

105. ELEMENTARY CHEMISTRY. Four credit hours. First semester. Associate Professor EVANS, Miss MORGAN, Mr. STRATTON, Mr. HALL.

A general course on the chemistry of the non-metals, arranged for students who have not presented chemistry as an entrance re-

quirement. Students taking this course will follow with Course 106, second semester.

106. ELEMENTARY CHEMISTRY AND QUALITATIVE ANALYSIS. Four credit hours. Second semester. Prerequisite, Course 105. Associate Professor EVANS, Mr. KELLOGG, Mr. STRATTON, Miss MORGAN.

A general course on the chemistry of the metals. The laboratory work accompanying is a general introductory course in qualitative analysis.

109. GENERAL CHEMISTRY. Four credit hours. First semester. One lecture, one quiz, six hours laboratory work weekly. Associate Professors EVANS and WITHROW, Mr. KELLOGG, Mr. WITZEMANN.

A general course on the chemistry of the non-metals. It is more advanced than Course 105, and is arranged for students who have had an acceptable course in elementary chemistry in a secondary school. Students taking this course will follow with Course 110, second semester.

110. GENERAL CHEMISTRY AND QUALITATIVE ANALYSIS. Four credit hours. Second semester. Prerequisite, Course 109. Time same as Course 109. Associate Professor EVANS, Mr. KELLOGG, Mr. STRATTON, Miss MORGAN.

A general course on the chemistry of the metals. It is more advanced than Course 106. The laboratory work is a general course in qualitative analysis.

127. ORGANIC CHEMISTRY. Five credit hours. First semester. Two lectures, one quiz, six hours laboratory work weekly. Prerequisite, an acceptable course in general chemistry. Professor MCPHERSON, Mr. BOORD.

This is a general introductory course in organic chemistry.

151-152. ORGANIC CHEMISTRY. Two credit hours. The year. Two lectures weekly. Prerequisite, an acceptable course in general chemistry; also in quantitative analysis, except by special permission of the instructor. Professor MCPHERSON.

This is a general course in organic chemistry.

153-154. ORGANIC CHEMISTRY. Two or three credit hours. The year. Six or nine hours laboratory work weekly. Laboratory open afternoons. This course must be accompanied or preceded by Course 151-152. Professor MCPHERSON, Mr. BOORD.

A general course in the preparation of typical organic compounds.

CIVIL ENGINEERING

(Office, Brown Hall, Room 33)

MR. WARD, MR. HINKLE

Equivalent term courses: 121=30, 4.

121. SURVEYING AND TOPOGRAPHICAL DRAWING. Six credit hours. First semester. Prerequisite, Mathematics 114 or 142.

The work will be divided into lectures, recitations, field work, computing, and drawing in such manner as the schedule and weather will permit.

DAIRYING

(Office, Townshend Hall)

PROFESSOR ERF, MR. CUNNINGHAM, MR. CLEVINGER

The department of dairying occupies the greater part of the first floor of Townshend Hall. It offers good facilities for instruction and investigation. The laboratories are equipped for the following lines of work: Milk testing, care and bottling of sanitary milk, buttermaking, cheese-making, ice-cream making, milk condensing, dairy mechanics.

Individual milk testing apparatus is furnished to each student. In the laboratory are found Babcock centrifuges, balances, etc., to make a complete test of the milk. The department operates a commercial, guaranteed milk and cream distributing plant. It has its own wagons for distributing the products and is equipped with modern milk dealers' implements, such as bottlers, washing outfits, and steam pressure sterilizers. In connection with this plant there is also a refrigerator provided for the bottled milk. The milk is received from two sources, part from an inspected farm and the balance from the University herd. The milk is bottled and sold, the students doing the work.

The farm cream separator laboratory is equipped with various styles of cream separators and coolers. The creamery laboratory is equipped with different types of cream ripeners, pasteurizes, starter cans, churns and printers.

Butter is made throughout the year on a commercial basis from milk and cream received from a number of dairies aggregating over 200 cows and the plant is operated on a regular commercial scale with students doing most of the work. The cheesemaking laboratory is equipped with a cold curing room and a cellar for making brick and Swiss cheese. Cream cheeses are made each week as a part of the commercial products of the laboratory and instruction is given along this line during the college year. The ice-cream making laboratory is equipped with freezers, brine and ice, and the proper mixing contrivances. A laboratory is provided for milk condensing where a complete condensing plant is provided for instructional purposes.

Dairy mechanics work is provided for in special laboratories which are equipped with boilers, engines, a refrigerating plant, pumps, pipe fitting apparatus, and soldering outfits. The laboratory work is of the most practical kind and is supplemented by lectures, recitations and quizzes in the class room.

Lectures and practical demonstration are given in dairy farm work, especial attention being paid to the Advanced Registry and Cow Testing Association work. The department has charge of this work in Ohio.

The work of the department is designed for three classes of students, the regular students in the two and four-year courses and the students of the special dairy courses designed for the practical dairyman who cannot devote a longer time to the scientific study of dairy methods.

Equivalent term courses: 101=12; 102=26; 103=27; 105=14; 107=16; 111=22; 114=28.

FOUR-YEAR COURSE

101. PRINCIPLES OF DAIRYING. First semester, four credit hours. Professor ERF, Mr. CUNNINGHAM.

Lectures are given on secretion of milk and the testing of milk and cream for butter fat; feeding and caring for dairy cows as related to the economical production of milk; formation of profitable herds; testing individual cows and herds for butter fat production,

and also how to enter and test cows for the Advanced Registries. In the laboratory, practical work will be given in testing milk and cream for butter fat, testing dairy herds for butter fat production, the practice of operating farm cream separators, the care of milk and cream, buttermaking, cheesemaking, also plumbing and soldering as needed in dairy operations.

102. FARM DAIRYING. Second semester, four credit hours. Professor ERF, Mr. CUNNINGHAM.

Lectures will be given on the planning and equipping of dairy barns, milk houses, dairy plants, farm milk houses, refrigerators and arranging of yards. Lectures will also be given on the handling and manufacturing of farm dairy products for the market, dairy farm management, and a study of the comparison of the different systems under various conditions. The laboratory work will consist of designing dairy barns, dairy plants, dairy houses, refrigerators, etc., including the operation of boilers and engines and the setting up and operating of dairy machinery.

103 or 104. CITY MILK SUPPLY. First or second semester. Two credit hours.

This includes lectures and practical work on the handling and distributing of milk for city trade, including milking, cooling, clarifying, pasteurizing, standardizing and bottling of milk and cream; the testing of milk for butter fat and total solids; methods of determining the bacterial count and leucocytes in milk, in order to comply with the rules laid down by the various city ordinances.

105 or 106. BUTTERMILKING. Five credit hours. First semester and repeated in the second semester. Mr. CLEVINGER.

In the lecture room the principles of buttermaking, including cream separation, churning, packing and marketing of butter and the development of pure cultures will be thoroughly discussed. In the laboratory the work discussed in the lecture room will be put into practice.

107 or 108. CHEESEMAKING. Three credit hours. First semester and repeated in the second semester. Mr. CLEVINGER.

Lectures on cheesemaking and laboratory work will be given in the manufacture of cottage, cream, Cheddar, brick, and Swiss cheeses.

110. ICE-CREAM MAKING AND MILK CONDENSING. Five credit hours. Second semester. Time to be arranged. Mr. CUNNINGHAM.

Lectures will be given on the theory of milk condensation and ice-cream making. Practical work with the vacuum pans and ster-

ilizers will be given in the condensing laboratory and practical work in ice-cream making will be given in the ice-cream making laboratory.

111. DAIRY MECHANICS. Three credit hours. First semester. Mr. CUNNINGHAM.

This work consists of one hour lecture and three hours laboratory work. It will treat of the construction and operation of steam boilers, steam and gas engines, steam pumps, compressors, refrigerating machines, belting, hanging of shafting, and pulleys, pipe fitting and soldering, and the operating of steam and gas engines. It is intended to train the student to do the mechanical work in milk plants, cheese factories, creameries, etc.

114. ADVANCED DAIRYING. Three credit hours. Second semester. Professor ERF.

Seminar on assigned readings in experiment station and other dairy literature will be arranged in this course. Investigation work of special character along any particular line of dairying will be arranged for. Laboratory work will be provided in connection with this work.

117-118. ADVANCED DAIRYING. Five to ten hours credit. Second semester. Professor ERF.

This course is intended for graduate students.

Special work will be arranged for students desiring to take up any particular phase of dairying. Any apparatus on hand will be furnished and room will be arranged for students desiring to take up any line, such as farm dairying, the feeding and breeding of dairy cows in relation to milk production, the study of milk in its various phases, buttermaking, cheesemaking, milk condensing, ice-cream making, etc.

TWO-YEAR COURSE

(Same as Courses 101 and 102)

DOMESTIC SCIENCE

(Office, Hayes Hall)

PROFESSOR WARDALL, ASSOCIATE PROFESSOR WHITE, ASSOCIATE PROFESSOR FLINT, MISS BLOHM

I. DOMESTIC SCIENCE.

Equivalent term courses: 101-102=1, 2, 3; 103=4; 104=10; 107=11; 108=12; 105-106=13.

101-102. THE SELECTION AND PREPARATION OF FOODS. Four credit hours. The year. Prerequisite Chemistry 106 or 110. Associate Professor WHITE.

A study of nutritive principles; their occurrence in ordinary food stuffs, their cost from various sources, and the principles involved in their preparation. Lectures and recitations are combined with laboratory work.

103. DIETETICS. First semester. Four credit hours. Prerequisite, Domestic Science 101-102, Physiology 101-102, and Agricultural Chemistry 123-124. Professor WARDALL.

A study of the principles of diet, food in its relation to health, standard dietaries, construction of dietaries and diet in disease. Laboratory work includes translation of standard dietaries into food materials, and some exercise in making dietary studies. Practice is also given in preparation of food for the sick.

104. THE HOUSE. Three credit hours. Second semester. Associate Professor WHITE.

Situation of the house with regard to general surroundings. The householder's interest in the construction of the house. Sanitary conditions in and around the house. Ventilation, water supply, heating, and plumbing. The purpose of the house. Prerequisite, Bacteriology 107.

105-106. SEMINARY. Two to five credit hours. The year. Open only to fourth year and graduate students. Professor WARDALL, Associate Professor WHITE.

107. HOUSEHOLD MANAGEMENT. Three credit hours. First semester. Prerequisite, Courses 101-102, Economics 135-136. Associate Professor WHITE.

The aim of this course is to set forth some of the principles underlying housekeeping, including the organization of the household, division of income, household processes, and care of the household.

108. TEACHERS' COURSE. Three credit hours. Second semester. Open to seniors. Professor WARDALL.

II DOMESTIC ART

Equivalent term courses: 101-102=1, 2, 3; 103=4; 104=5; 105=6.

101-102. TEXTILES. Two credit hours. The year. Prerequisite, or concurrent, Art. 101-102.

This course includes the study of fibres and fabrics from an historic, economic, and social standpoint. In the laboratory the making of articles involves the proper selection of material and the working out of suitable designs. Associate Professor FLINT, Miss BLOHM.

103. DRESS. Three credit hours. First semester. Prerequisite, Domestic Art 101-102, Art 105-106 must be taken with this work.

In this course economics, hygiene, design, and color are considered in their relation to dress. The laboratory work includes the drafting and designing of patterns, the careful selection and combination of materials, and the making of dresses. Associate Professor FLINT, Miss BLOHM.

104. HOUSEHOLD ART. Three credit hours. Second semester. Prerequisite, or Concurrent Art 105-106.

This course includes the study of house furnishings, their color, design, suitability for purpose and cost. The laboratory work consists of visits to shops, the making of plans and estimates for house furnishing and the designing and making of accessories in furnishing and decorating the house. Associate Professor FLINT, Miss BLOHM.

NOTE.—In all courses students provide their own materials.

105. DRESS. Three credit hours. Second semester. Associate Professor FLINT.

Continuation and amplification of 103. Designed for those intending to specialize in this subject.

DRAWING

(See Engineering Drawing)

ECONOMICS AND SOCIOLOGY

(Office, Room 211, University Hall)

PROFESSOR HAGERTY, PROFESSOR HAMMOND, ASSOCIATE PROFESSOR MCKENZIE, ASSISTANT PROFESSOR LOCKHART, ASSISTANT PROFESSOR GEPHART, ASSISTANT PROFESSOR HUNTINGTON

I. ECONOMICS

Equivalent term courses: 135-136=33; 139-140=42-43.

135-136. PRINCIPLES OF ECONOMICS. Three credit hours. The year. Assistant Professor HUNTINGTON.

A careful study of the laws of production, exchange, distribution, and consumption of wealth, combined with an analysis of the industrial actions of men as regards land, labor, capital, money, credit, rent, interest, wages, etc. Text-book, lectures, and individual investigations.

138. PRINCIPLES OF ECONOMICS. Five credit hours. Second semester. Open only to students in Domestic Science and Domestic Art.

139. PUBLIC FINANCE. Two credit hours. First semester. Prerequisite Economics 135-136. Assistant Professor LOCKHART.

Public expenditures; sources of revenue with special reference to problems of taxation, public credit; the budget; financial administration.

140. FINANCIAL HISTORY OF THE UNITED STATES. Two credit hours. Second semester. Prerequisite, Economics 135-136. Assistant Professor LOCKHART.

A study of the fiscal and monetary history of the country from colonial times to the present with special reference to federal taxation, loans, and financial administration, currency legislation, and the development of banking institutions.

167. RAILWAY ECONOMICS. Three credit hours. First semester. Prerequisite, Economics 135-136. Professor HAMMOND.

The development of means of transportation. Railway growth and consolidation. Railway rate theories and practice. Railway commissions and public control. Government ownership of railroads.

168. RAILWAY ORGANIZATION AND ADMINISTRATION. Three credit hours. Second semester. Prerequisite, Course 167. Professor HAMMOND.

The organization of modern railway systems and the functions of the various departments. Rate making and the work of the traffic department. The work of the industrial commissioner. Railway finance and statistics. The relation of the railroads to the accounting division of the Interstate commerce commission.

2. SOCIOLOGY

Equivalent term course: 101-102=1.

101-102. PRINCIPLES OF SOCIOLOGY. Three credit hours. The year. Professor HAGERTY, Associate Professor McKENZIE.

A study of the fundamental principles of sociology. Text-book, lectures, collateral reading, and individual investigations.

ENGINEERING DRAWING

(Office, Room 42, Brown Hall)

PROFESSOR FRENCH, ASSISTANT PROFESSOR LEWIS, ASSISTANT PROFESSOR MEIKLEJOHN, MR. SHEETS, MR. NORRIS

Equivalent term courses: 116=14; 119=40; 125=10; 127=20; 128=15.

116. PEN DRAWING. Two credit hours. Second semester.

119. CLAY MODELING. Two credit hours. First semester. Prerequisite, Drawing 115.

125. MECHANICAL DRAWING. Two credit hours. First semester.

126. Repetition of 125.

127. MECHANICAL DRAWING. One and one-half credit hours. First semester.

Elementary mechanical and architectural drawing.

128. HOUSE PLANNING. One and one-half credit hours. Second semester. Prerequisite, Drawing 127.

ENGLISH

(Office, Room 116, University Hall)

PROFESSOR DENNEY, PROFESSOR MC KNIGHT, ASSOCIATE PROFESSOR GRAVES,
ASSISTANT PROFESSORS DUNCAN, BLANCHARD, LEIGHTON, BURNHAM

Equivalent term courses: 101-104=1, 2, 3; 108=5; 107=6; 131=8; 132=45.

101. PARAGRAPH WRITING. Description and Narration. Two credit hours. First semester. (Course 101 will be repeated in the second semester as Course 102 for the benefit of those who fail, the class meeting Saturdays at 9 a. m., in Room 119.) All instructors.

104. PARAGRAPH WRITING. Exposition and Argumentation. Two credit hours. Second semester. Prerequisite, Course 101. Same hours as for Course 101. (Course 104 is also offered in the Summer.) All instructors.

107. ADVANCED DESCRIPTION AND NARRATION. Two credit hours. First semester. Prerequisite, Course 101. Associate Professor GRAVES.

108. ADVANCED EXPOSITION AND CRITICISM. Two credit hours. Second semester. Prerequisite, Course 101. Associate Professor GRAVES.

121. PRINCIPLES OF PUBLIC SPEAKING. Two credit hours. First semester. Assistant Professor BLANCHARD.

122. DEBATING. Two credit hours. Second semester. Assistant Professor BLANCHARD.

132. SURVEY OF AMERICAN LITERATURE. Three credit hours. Second semester. No prerequisite course. Same instructors as in Course 131.

133. SURVEY OF ENGLISH LITERATURE. Three credit hours. First semester. No prerequisite course. Professor MCKNIGHT, Associate Professor GRAVES, Assistant Professors DUNCAN, LEIGHTON and BURNHAM.

FORESTRY
(Horticultural Hall)

PROFESSOR LAZENBY

Equivalent term courses: 101=1; 102=2; 104=3; 105=4; 106=5; 107=6; 108=9; 109=10; 112=12.

For field work in Forestry, the University estate has a typical primitive woodlot, a fringe of forest trees bordering the Olentangy river, and a good collection of individual trees and shrubs on the campus. Columbus and vicinity offer fairly good opportunities for the study of forestry. Numerous electric car lines take the student at small cost, to a variety of hard wood forests, where different conditions and methods of treatment can be studied. Lumber yards, dry houses, wood working industries and saw mills are to be found in the city.

In laboratory work, students receive instruction in timber physics and certain features of wood technology, and for this a collection of wood specimens, sections of trees, etc., are provided, and will be increased as rapidly as possible. Students will be encouraged to carry on original work, and to write theses under the supervision of an instructor. Special credit is given for such work, but a thesis is not required for a degree.

101. INTRODUCTION TO FORESTRY. Two credit hours. First semester.

A general presentation of the subject, its objects, methods, and economic importance. Lectures and field work.

102. INTRODUCTION TO FORESTRY. Two credit hours. Second semester.

A survey of forest literature and forest organizations, including state and national forest services. Study of local trees and shrubs. Lectures and field work.

104. ARBORICULTURE AND TREE SURGERY. Three credit hours. Second semester.

The cultivation and management of trees for various specific purposes, such as windbreaks, hedges, shade and ornament, or small plantations for post timber, for maple syrup, for nuts, etc.; treatment of diseased and injured trees.

105. SILVICULTURE. Three credit hours. First semester.

Lectures and field work. Includes a study of soil, climate, exposure and other factors influencing forest growth; descriptions of typical woodlands and forests; collecting and testing forest tree seeds. Care of woodlands and forests, including pruning, thinning, protection from fire and other inanimate and animate enemies.

106. SILVICULTURE. Three credit hours. Second semester.

Lectures and field work. Forest reproduction by natural and artificial means; tree propagation; practice in seedbeds and nursery; sowing seeds and transplanting in forests; establishment and extension of wood lots.

107. FOREST MENSURATION AND TIMBER PHYSICS. Four credit hours. First semester.

Lectures, laboratory, and field work. Methods of measuring the volume of felled and standing trees; of ascertaining the volume of definite forest areas; studying the age, rate of growth and future yield of trees and forests; making stem or section analysis; estimating values of trees and forest stands.

Surveys and working plans, uses and physical properties of wood.

108. FOREST UTILIZATION AND LUMBERING. Four credit hours. Second semester.

Lectures and field work. Methods of lumbering, including clearing of wood lots, transportation, milling, and marketing; minor wood lot and forest industries.

109. FOREST HISTORY AND RELATIONS. Four credit hours. First semester.

Lectures and seminars; evolution of forests; statistics of areas, product, and trade; relation of forests to climate, soil, waterways, and general welfare.

110. FOREST ECONOMICS AND POLICIES. Four credit hours. Second semester.

Lectures and seminar; state and national forest legislation and organization; state and national forests, and forest problems; civil service regulations; foreign forest service.

GEOLOGY

(Office, Orton Hall)

PROFESSOR PROSSER, PROFESSOR BOWNOCKER, ASSISTANT PROFESSOR
HUBBARD, MR. MORSE

The University offers excellent facilities for the study of Geology. By an act of the Legislature it has been put in

possession of all the collections made by the State Geological Survey, and these collections have been supplemented by valuable additions of fossils and minerals from various sources. These collections embrace a representation of every geological formation shown in Ohio. Orton Hall, completed at a cost of more than \$100,000, is designed for the permanent accommodation of the large geological collection of the University and for the work and instruction in the department of Geology. A portion of it, at present, is occupied by the library and reading room. The building is two stories in height, with a high basement; is built of brick and faced with sandstone, and is fireproof throughout. Some of the material was contributed by various quarries of the State of Ohio, and almost all of the finer varieties of Ohio building stone are represented in the columns, walls, and ceiling panels of the vestibule.

Equivalent term courses: 162=1; 165=2; 152=2; 153=5.

162. ELEMENTARY PHYSIOGRAPHY. Four credit hours. Second semester. Assistant Professor HUBBARD.

The physiographic features of the earth's surface and the agencies producing them; the atmosphere, and the ocean. Recitations, lectures, and map work. One period per week will be devoted to laboratory or field work.

165. GENERAL GEOLOGY. Three credit hours. First semester.

The first half of the semester, or while the weather permits, field trips will alternate with the laboratory periods. Field trips Friday afternoon or Saturday morning when the laboratory work will be omitted for that week. Professor PROSSER and Mr. MORSE.

Structural, dynamical, and historical geology. The lectures are illustrated by maps, specimens, and lantern views. The common rock-forming minerals and rocks are studied in the laboratory; while in the field various illustrations of geological structure are pointed out and formations identified.

152. GENERAL GEOLOGY. Three credit hours. Second semester. Geology 165 repeated. Professor PROSSER, Assistant Professor HUBBARD and Mr. MORSE.

153. APPLIED GEOLOGY. Three credit hours. First semester. Prerequisite, Geology 165 or 152. Professor BOWNOCKER and Mr. MORSE.

The common minerals and rocks of the earth's crust, their breaking down and the formation of mantle rock. Fuels, building stones, lime, cement, etc. The most useful metals.

GERMANIC LANGUAGES AND LITERATURES

(Office, Room 317, University Hall)

PROFESSOR RHOADES, ASSOCIATE PROFESSOR EISENLOHR, ASSISTANT PROFESSORS THOMAS, BUSSE, AND BARROWS, MR. BUSEY

Equivalent term courses: 101-102=1; 103, 104=4; 106=2

101-102. ELEMENTARY. Four credit hours. The year.

103. INTERMEDIATE GERMAN. Four credit hours. First semester. Prerequisite, 101-102, or two entrance units.

104. EASY CLASSICAL READING AND COMPOSITION. Four credit hours. One semester. Prerequisite, 103, or three entrance units.

106. SCIENCE READING. Four credit hours. One semester. Prerequisite, 103, or three entrance units.

To students offering four entrance units in German other courses are open. Such students should confer with the head of the department.

HORTICULTURE

(Horticultural Hall)

PROFESSOR PADDOCK, ASSISTANT PROFESSOR DAVIS, MR. MONTGOMERY

Equivalent term courses: 101-102=21; 103=24 and $\frac{1}{2}$ 2; 105-106=22; 107=17; 108=15; 111-112=1; 113-114=19; 118=6, 3.

101. PRINCIPLES OF HORTICULTURE. Four credit hours. First semester. Four year course in Horticulture. Assistant Professor DAVIS.

The principles of plant growth, with special reference to horticultural crops, including the problem of tillage, drainage, frosts, weeds, insects, propagation, pruning, and spraying.

102. PRINCIPLES OF HORTICULTURE. Four credit hours. Second semester. Four years course in Horticulture. A continuation of 101. Assistant Professor DAVIS.

103. OLERICULTURE OR VEGETABLE GARDENING. Three credit hours. First semester. Four year course in Horticulture. Mr. MONTGOMERY.

Including a study of locations, soils, manures, and fertilizers, marketing, etc., as related to the home and market garden. Each of the garden vegetables are considered specifically.

104. OLERICULTURE OR VEGETABLE GARDENING. Three credit hours. Second semester. Four year course in Horticulture. A continuation of 103. Mr. MONTGOMERY.

105. POMOLOGY. Four credit hours. First semester. Four year course in Horticulture. Professor PADDOCK.

Including the propagation, pruning, spraying, cultivating, harvesting, etc., with special reference to the fruit commonly grown in the temperate zone. Tropical and sub-tropical fruits of commercial importance in the North will also receive consideration.

106. POMOLOGY. Four credit hours. Second semester. Four year course in Horticulture. A continuation of 105. Professor PADDOCK.

107. PLANT VARIATION. Three credit hours. First semester. Four year course in Horticulture. Professor PADDOCK.

A course designed for those interested in plant breeding and in the modification and improvement of plants by mutation, crossing, dwarfing, forcing, etc., together with a discussion of the current theories of evolution as applied to the variation and amelioration of plants under cultivation.

108. LANDSCAPE GARDENING. Three credit hours. Second semester. Two and four courses in Horticulture. Professor PADDOCK.

A study of the art of producing picture-like or landscape effects; the making of lawns, walks, drives, and the correct planting of trees, shrubs, and flowers for the external adornment of home and public grounds.

109. EXPERIMENTAL HORTICULTURE. Three credit hours. First semester. Four years course in Horticulture. Time to be arranged.

This course is designed to give the student training in research methods. Technical problems are assigned depending upon the needs and the inclination of the student. This work not only gives practice in the application of exact methods, but affords abundant opportunities to become familiar with the literature of horticulture.

110. EXPERIMENTAL HORTICULTURE. Three credit hours. Second semester. Four years course in Horticulture. A continuation of 109. Time to be arranged.

111. PRINCIPLES OF HORTICULTURE. Four credit hours. First semester. Two year courses in Horticulture and Agriculture. Assistant Professor DAVIS.

This course is essentially the same as 101 and 102 modified and adapted to the needs of the two year students.

112. PRINCIPLES OF HORTICULTURE. Four credit hours. Second semester. Two year courses in Horticulture and Agriculture. A continuation of 111. Assistant Professor DAVIS.

113. POMOLOGY. Four credit hours. First semester. Two year course in Horticulture. Professor PADDOCK.

This course is essentially the same as 105 and 106 modified and adapted to the needs of the two year students.

114. POMOLOGY. Four credit hours. Second semester. Two year course in Horticulture. A continuation of 113. Professor PADDOCK.

115. OLERICULTURE OR VEGETABLE GARDENING. Four credit hours. First semester. Two year course in Horticulture. Mr. MONTGOMERY.

This course is essentially the same as 103 and 104 modified and adapted to the needs of the two year students.

116. OLERICULTURE OR VEGETABLE GARDENING. Four credit hours. Second semester. Two years course in Horticulture. A continuation of 115. Mr. MONTGOMERY.

118. POMOLOGY. Four credit hours. Second semester. Four year course in Agriculture. Assistant Professor DAVIS.

This course deals with the fundamental problems of fruit growing, with special reference to the home or farm orchard and small fruits. The problems of soil location, propagation, pruning, spraying, cultivation, harvesting and marketing receive special consideration.

119. FLORICULTURE. Three credit hours. Second semester. Four year course in Horticulture.

A discussion of the history, propagation, culture, diseases and insects of florists' plants.

INDUSTRIAL ARTS

(Office, Room 2, Hayes Hall)

PROFESSOR SANBORN, MR. CROWE, MR. BEEM

The shops occupy the north wing of Hayes Hall and afford excellent facilities for instruction in both the practical details and the underlying principles of carpentry, pattern-making, and forging. The carpenter and pattern shops are equipped with fifty benches with complete sets of carpenter tools for each, twenty-four turning lathes with the

necessary turning tools, a pony planer, a buzz planer, a circular rip and cross-cut saw, a scroll saw, a band saw, a trimmer, and two power grindstones. The forge shop is equipped with twenty stationary forges with anvils and tools for each, a heating forge, a portable hand forge, a foot-power hammer, a blacksmith's drill and a punch, shear, and bar-cutter.

SHOP WORK

Equivalent term courses: 101 or 102=1; 103 or 104=2.

101 or 102. CARPENTRY AND PATTERN MAKING.

Practice in carpentry and pattern-making, including sawing, planing, mortising, framing, and other work involving the use of the ordinary carpenter tools; and the making of simple patterns.

103 or 104. FORGING.

The use and care of forge, fire, and tools; practice in iron and steel forging, including such operations as cutting, bending, drawing, upsetting, shaping, and welding iron; the making, hardening, and tempering of steel punches, drills, and cold chisels.

MATHEMATICS

(Office, Room 314, University Hall)

PROFESSOR BOHANNAN, PROFESSOR MC COARD, PROFESSOR SWARTZEL, PROFESSOR KUHN, ASSOCIATE PROFESSOR ARNOLD, ASSOCIATE PROFESSOR RASOR, ASSISTANT PROFESSOR PRESTON, ASSISTANT PROFESSOR BAREIS, ASSISTANT PROFESSOR MORRIS, MISS RICKARD

Equivalent term courses: 103=1; 104=3a; 131, 132=31, 32, 33.

103. ELEMENTARY ALGEBRA. Five credit hours. First semester. Venable. Assistant Professor PRESTON.

104. PLANE GEOMETRY. Five credit hours. Second semester. Venable. Assistant Professor PRESTON.

131. COLLEGE ALGEBRA AND TRIGONOMETRY. Five credit hours. First semester.

132. TRIGONOMETRY AND ANALYTICAL GEOMETRY. Five credit hours. Second semester.

METEOROLOGY

(Office, Townshend Hall)

MR. J. WARREN SMITH

101 or 102. METEOROLOGY. Two credit hours. First or second semester.

MILITARY SCIENCE AND TACTICS

(Office, The Armory)

CAPTAIN GEORGE L. CONVERSE, U. S. A., RETIRED

The Military Department is open five days during each week of each term. Required of all students first and second year, unless excused by the Military and Gymnasium Board.

1. MILITARY DRILL. One credit hour. First semester. *M., Tu., W., at 11 or 4.* Gallery practice, *M., Tu., W., Th., 1 to 5.*

2. MILITARY DRILL. One credit hour. Second semester. Drill Regulations, *M., Tu., W., at 11 or 4.* Gallery practice, *M., Tu., W., Th., 1 to 5.*

PHYSICAL EDUCATION FOR MEN

(The Gymnasium)

PROFESSOR WINGERT, MR. KIBLER, MR. BAUER

1. PHYSICAL EDUCATION. One credit hour. Two hours per week. The year. (a) Lectures on hygiene and physiology of exercise first two weeks, first semester. (b) Corrective: A graded course of free-hand exercise stretching, relaxing, stimulating, exercise with light hand apparatus for the relief and correction of slight body defects, deformities, improper carriage, etc. (c) Educative: Graded progressive exercise on the apparatus and mats to promote muscular tone, vigor, vitality, endurance. (d) Recreative: Gymnasium games, mental relaxation, non-competitive exercises. (e) Ability to swim is required and free instruction is given to those who cannot swim.

2. ADVANCED EXERCISES. Elective. (a) Advanced exercises on the apparatus and mats. (b) Combatative exercises—boxing, fencing, wrestling. A small charge is made to those electing this work. (c) Recreative—football, baseball, basketball, tennis, track and field sport, cross-country running, etc. Special hours are arranged for those electing the above exercise and credit given in regular course.

PHYSICAL EDUCATION FOR WOMEN

(The Gymnasium)

DR. LITTLEJOHN, MISS DARNELL

1. PHYSICAL EDUCATION. One credit hour. Four hours per week during first year of a student's residence. (a) Lectures on hygiene and purpose of different kinds of physical exercises, four

hours per week, first two weeks of first semester, first week of second semester. (b) Practical work in gymnasium, as follows: (1) Corrective work: exercises for correction of faulty position of different parts of body, and of deformities; for development of chest, etc. (2) Educative work: exercises to develop co-ordination of groups of muscles, accuracy of movement, and to impart grace and beauty and a ready expression of thought in physical motions. (3) Recreative: classic dancing, and rhythmic movements, gymnastic games, and relaxing exercises. (4) Athletics (elective): carefully supervised basket ball, running, etc., for those who desire it. A physical examination is made by the directors of every woman entering this course before she can begin the gymnasium work, and, if necessary, special work will be prescribed to meet her physical needs.

2. PHYSICAL EDUCATION. One credit hour. The year. Four hours per week during the second year of a student's residence.

PHYSICS

(Office, Room 24, Physics Building)

INSTRUCTOR HEIL

Equivalent term course: 101=1.

101. ELEMENTARY PHYSICS. Six credit hours. First semester. Mr. HEIL.

Recitations and laboratory practice. Other courses in Physics may be elected by four-year students in Agriculture.

ROMANCE LANGUAGES AND LITERATURES

(Office, Room 305, University Hall)

PROFESSOR BOWEN, PROFESSOR BRUCE, ASSOCIATE PROFESSOR INGRAHAM,
ASSISTANT PROFESSOR PEIRCE, ASSISTANT PROFESSOR
HAMILTON, DR. FALORSI

I FRENCH

Equivalent term courses: 101-102=1; 103-104=2.

101-102. ELEMENTARY FRENCH. Four credit hours. The year. Grammar: Thieme and Effinger's, or equivalent. Reader: Aldrich and Foster's, or Bowen's First Scientific. Historical and narrative prose; one or more prose comedies. Nine sections. All instructors.

Stress laid first upon the acquisition of a correct pronunciation, after which the entire energy of the student is directed toward the attainment of a full and accurate reading knowledge of the lan-

guage. Grammar and composition made to contribute to this end. Sight reading emphasized.

103-104. MODERN FRENCH LITERATURE. Four credit hours. The year. Four sections. Prerequisite, course 101-102, or equivalent. Professor BRUCE, Assistant Professor PEIRCE, Assistant Professor HAMILTON.

The work of the year deals with the following subjects: (1) Contes; (2) The novel (Balzac or Hugo); (3) Lyric poetry; (4) Romantic drama (Hugo). Prose composition. Systematic attention given to syntax and idiom. Lectures supplement the work. Private reading required.

II SPANISH

Equivalent term courses: 101-102=1; 103-104=2.

101-102. ELEMENTARY SPANISH. Four credit hours. The year. Grammar: (Hills and Ford's), and Ingraham's *Victoria y Otros Cuentos*. Easy prose and plays. Composition and practice in speaking. Four sections. Associate Professor INGRAHAM, Assistant Professor HAMILTON, Mr. CHAPIN.

103-104. MODERN SPANISH LITERATURE. Four credit hours. The year. Prerequisite: courses 101-102, or equivalent. Associate Professor INGRAHAM.

The modern novel and drama. Lectures covering a survey of the literature. Composition and practice in speaking continued.

RURAL ECONOMICS

(Office, Townshend Hall)

PROFESSOR PRICE

The subject of rural economics has received comparatively little attention until recently by American agricultural colleges, and, at the present time, there is little uniformity in the treatment of the subject in the different institutions in which it is offered. The department includes instruction in farm management, farm accounts, history of agriculture, and agricultural economics.

The facilities offered for the study of farm management include the University farm, containing over three hundred acres, and the records that have been kept of its operations for many years. Adjoining Columbus, and with-

in reach by electric cars, there are many well equipped and well managed farms, which are frequently visited by classes in this department.

For the study of the history of agriculture and agricultural literature, the University Library offers excellent facilities in the large number of agricultural works which it contains and the complete files of agricultural periodicals. In the study of agricultural economics access is had to the State Library, as well as the University Library, and excursions are made in the State to investigate agricultural conditions.

Equivalent term courses: 101=8; 102=1; 103=2; 105=4; 104=6; 107-108=10.

101. FARM ACCOUNTS AND RECORDS. Two credit hours. First semester. Professor PRICE.

Lectures and practice work. The course will deal with the general principles of accounting and their application to farm business. Systems of keeping farm records that are best adapted to different methods of farming will be studied.

102. FARM MANAGEMENT. Four credit hours. Second semester. Two-year courses in Agriculture and Horticulture. Professor PRICE.

Lectures, recitations, and visits to farms in the vicinity of Columbus. The course will include a comparative study of the different systems of farm management; the cost of producing and marketing farm products; methods of renting, leasing, and operating farm lands; and keeping farm accounts and records.

103. FARM MANAGEMENT. Four credit hours. First semester. Four-year course in Agriculture. Professor PRICE.

Lectures and recitations upon the problems of farm management, the relative profits of different systems of farm management, and their effect upon maintaining the fertility of the land. The business of farming from the standpoint of the individual is studied.

104. AGRICULTURAL ECONOMICS. Three credit hours. Second semester. Professor PRICE.

Lectures and recitations upon the production, distribution, transportation, and marketing of agricultural products. The relation of the industry of agriculture to other industries, co-operation in agriculture, agricultural organizations, and the social conditions of agriculture are considered.

105. HISTORICAL AND COMPARATIVE AGRICULTURE. Three credit hours. First semester. Professor PRICE.

Lectures and recitations upon the history of agriculture and the evolution of agricultural methods, with special reference to the agriculture of the present day. The development of agricultural literature together with literature of the present and current periodicals are studied.

107-108. RESEARCH WORK FOR GRADUATE STUDENTS. Five to ten credit hours. Professor PRICE.

Opportunity is offered to carry on special lines of research in farm management, history and literature of agriculture, and in agricultural economics.

SHOP WORK

(See Industrial Arts)

SPANISH

(See Romance Languages)

VETERINARY MEDICINE

(Office, Veterinary Laboratory)

PROFESSOR WHITE, ASSISTANT PROFESSOR HADLEY

Students in Agriculture taking required or elective work in Veterinary Medicine can avail themselves of the whole equipment of the College of Veterinary Medicine. For the class room work a large number of papier-mache models, wet and dry anatomical specimens, sample horseshoes, charts, diagrams and drawings, surgical instruments, and apparatus are constantly employed to supplement text-book teaching. The Clinic Building affords excellent facilities for the care and treatment of diseased and injured animals.

The Veterinary Laboratory building is especially designed for the teaching of Veterinary Medicine. It contains the Veterinary Museum, probably the largest in the country, a modern sanitary dissecting room, and laboratories for anatomy, pharmacology, pathology, and bacteriology.

Equivalent term courses: 149=28; 150=30.

149. VETERINARY ANATOMY. Three credit hours. First semester. Assistant Professor HADLEY.

Brief outline of the anatomy of the horse and ox.

150. VETERINARY HYGIENE AND SANITATION. Three credit hours. Second semester. Professor WHITE.

The commoner sporadic and infectious diseases, minor surgery, castration, horse-shoeing and soundness are briefly considered in this course.

ZOOLOGY AND ENTOMOLOGY

(Office, Room 1, Biological Hall)

PROFESSOR OSBORN, PROFESSOR LANDACRE, ASSOCIATE PROFESSOR HINE,
MR. DITTO

Work in this department is largely on the laboratory plan, the effort being to have each student become familiar with typical forms of animal life, acquire the power to discover facts for himself, and use them on practical applications. Animals that have an important economical relation are used as examples for their respective groups. While the aim is to give a thorough and sound training in the underlying principles of zoology and entomology, the practical bearing of these is shown by use of such forms as the liver fluke of sheep to show effects and relations of parasitism; the earth-worm in its relation to soil formation; trichina as affecting human health and meat exports; insects, both useful and injurious; fishes as a source of food; relation of birds to insect control; and importance of certain groups of birds and mammals as the source of our domestic animals. Advanced and graduate courses provide for training in methods of reserch, and especial attention is given to preparation for investigation as experiment station workers.

Equivalent term courses: 101-102=31; 107-108=4; 109-110=7; 111=8; 113-114=9, 10, 11; 143-144=26.

101-102. ELEMENTARY ZOOLOGY. Three credit hours. First semester, invertebrates to the arthropods. Second semester, arthropods and vertebrates. Professor OSBORN, Professor LANDACRE, Assistant Professor BARROWS.

This course includes a general discussion of groups, dissection of types, and an outline of classification. Especial attention is given to forms of economic importance either from their detrimental effects on crops, stock, etc., or from their utility in various industries or as domestic species.

107-108. ECONOMIC ENTOMOLOGY. Three credit hours. The Year. Prerequisite, Course 101-102. Associate Professor HINE.

A systematic study of groups of insects, with special reference to injurious and beneficial species. A foundation is laid for special study in Entomology. Preparation of collections, essays, life studies, and use of remedial measures, along with laboratory studies on general anatomy.

109-110. SYSTEMATIC AND PRACTICAL ENTOMOLOGY. Three credit hours. The year. Elective in short course in Agriculture. Required in short course in Horticulture. First year. Associate Professor HINE.

111. PARASITES OF DOMESTIC ANIMALS. One credit hour. First semester. Elective. Professor OSBORN.

A lecture course devoted to the principal parasites affecting domestic animals, intended especially to meet the needs of those who intend to give particular attention to stock raising.

113-114. SPECIAL ENTOMOLOGY. Four credit hours. The Year. Elective in Junior or Senior year. Professor OSBORN.

Studies of life histories, collection, and classification in selected groups. Field work and lectures.

Studies of winter condition of insects. Insecticides, insecticide machinery, methods of preparing insect illustrations, greenhouse pests, etc.

Investigations of selected groups or species. Lectures on insect legislation, distribution, natural enemies, special methods of control, etc.

(Courses 113 and 114 are intended as practical courses in entomological research, adapted especially for those who wish to give special attention to this branch with reference to future work in agriculture or horticulture, and to furnish a preparation for those who have in view work as entomological investigators in experiment stations or as teachers in agricultural schools. They may be taken as graduate courses if not elected earlier, or continued as special lines of research during a graduate course embracing other special subjects.)

143-144. ZOOLOGICAL SEMINAR. One credit hour. The Year. Professor OSBORN, Professor LANDACRE, Associate Professor HINE.

Discussion of recent literature in zoology and entomology, reviews of progress in certain lines of investigation and presentation of research studies. Advanced students in Zoology and Entomology are expected to elect this course, and it is open to others who have had preliminary courses.

GENERAL INFORMATION

FEES

I. INCIDENTAL FEE. The fee for students, residents of Ohio, is ten dollars a semester, payable in advance as a condition of registration. The fee for non-residents is fifteen dollars a semester, payable in advance as a condition of registration. Children of alumni in the matter of fees are treated as residents of Ohio.

In the case of former students, if this fee is not paid until the second day of the semester, one dollar will be added, and for each succeeding day of the delinquency fifty cents will be added.

LABORATORY FEES. A laboratory fee of two dollars a semester is charged in all laboratory courses using gas, water, electric current, or steam; and a fee of one dollar for all other laboratory courses. Students are required to pay for materials used in laboratories in addition to the laboratory fees.

LOCKER FEE. The gymnasium is free to all students, but those desiring a locker will be charged a fee of two dollars a semester. This fee includes towels.

GRADUATION FEE. A fee of five dollars to cover expenses of graduation, diplomas, etc., is required of each person receiving one of the ordinary degrees from the University, and this fee must be paid before the degree is conferred.

All semester dues must be paid at the opening of each term as a condition of admission to classes.

OTHER EXPENSES

Boarding clubs are formed in the neighborhood of the University. Furnished rooms are rented at seventy-five

cents to one dollar and twenty-five cents a week for each student, and the cost of table board is three dollars to four dollars a week. A limited number of women students will be given table board at Oxley Hall at a price not to exceed three dollars and a half a week.

Board with furnished rooms can be obtained in private families within convenient distances of the University, at rates varying from four dollars to six dollars a week.

The uniform with which the members of the regiment are required to provide themselves costs (without overcoat) about twelve dollars and a half. It is quiet in pattern and is designed to be worn daily in place of civilian dress.

The expenses incident to living in Columbus will bring the total cost per year, exclusive of other clothing, to from \$250 to \$400, according to the degree of economy exercised by the student.

WOMEN STUDENTS. As far as possible women students should make arrangements for room and board before coming to Columbus. While the rooms in Oxley Hall are usually spoken for one or two years in advance, an effort will be made to secure suitable accommodations in private residences. Prospective women students should address Miss Dora Eaton, Oxley Hall, Columbus, Ohio.

FREE SCHOLARSHIPS

A free scholarship, good for two years in the College of Agriculture and Domestic Science, is granted to one student annually from each county in Ohio, but not more than two scholarships can be in force at any one time from any county.

Each scholarship is valid for two years from its grant, and covers incidental and fixed laboratory fees. In the chemical laboratories a student holding a free scholarship shall be required to pay for materials used and to make a deposit to cover breakage the same as other students. In case of other than new students the scholarship will be

accepted only after approval by the Board of Trustees. All scholarships must be presented to the Secretary of the Board of Trustees on or before November 1st of the year in which they are to be used, otherwise they are not valid.

The free scholarships cannot be used in the special winter term courses. The appointments are made by the County Boards of Agriculture, and are not transferable by the appointees. To learn whether the scholarship of a given county for the current year has been granted, inquiry should be addressed to the Secretary or President of the County Agricultural Society. For further information concerning these scholarships, inquiries should be addressed to the Dean of this College.

CHRISTIAN ASSOCIATIONS

The Young Men's Christian Association has come to occupy a prominent place in university life. It has a membership of about four hundred men, and is affiliated with the World's Student Christian Federation.

Religious meetings are held for men on Sunday afternoon; there are also frequent meetings for the promotion of social intercourse and good fellowship. Courses in systematic Bible study and in modern missions are offered. A most helpful feature of the work is that in the interest of new students at the opening of the school year. Desirable rooms and boarding places are found and posted for reference at the Association Office. Representatives of the Association meet the trains, assist students in finding satisfactory locations, and endeavor in every way to make them feel at home. The Employment Bureau helps to find work.

A copy of the Students' Handbook, giving information about Columbus, the University, and the various college organizations and activities, will be sent free to prospective students. For this handbook or for further information, address the General Secretary of O. S. U. Y. M. C. A., University Campus, Columbus, Ohio.

The Young Women's Christian Association holds religious meetings regularly at noon on Tuesdays. This organization is active and efficient in working for the higher interests of the young women.

SELF SUPPORT

There is a large amount of work on the University farm and campus and in the gardens, orchards, and greenhouses, which can be done by students, for which they are paid at current rates for such labor, and each year several thousand dollars are paid out in this way. By this means, together with what can be earned by steady labor during the summer vacation, a considerable number of students defray all their expenses.

Preference is given to students who are willing to devote a certain number of hours each day to the work assigned.

Work cannot be promised to all applicants, and is not guaranteed to any.

Applications for employment should be made to the Superintendent of the University farm. Labor blanks will be furnished upon request.

CADET SERVICE

Under the law of Congress establishing the University, it is required that instruction shall be given in military science and tactics, and the Trustees have directed that all male students except those in the College of Law, and such others as may be specially excused for physical disability or for having reached the age limit of twenty-five years, shall render two years of cadet service as a condition of graduation. A uniform has been prescribed, with which each member is required to provide himself.

PHYSICAL EDUCATION

Physical Education is conducted under the direct supervision of the Director, who is a graduate physician and a member of the University Faculty. He is assisted by an associate director for women, also an assistant and twenty student aids, who are selected each year from the upper classmen and those who show proficiency in their work. The main floor of the gymnasium (80 by 150 ft.) is thoroughly equipped with the most modern gymnastic apparatus. It is used by the women in the forenoon while the men exercise in the new gymnasium on the first floor. In the afternoon the main floor is used exclusively by the men for class work, athletics, basketball, recreative games, etc. Regular class exercise two hours per week is required during the first year of a student's residence at the University, or until he has successfully completed three terms of this work. A thorough physical examination is made of each student at the opening of the college year. Physical defects, abnormalities, and weaknesses are noted, and judicious, healthful exercise is prescribed to fit the student's individual needs.

AGRICULTURAL EXTENSION

Agricultural Extension was organized to carry instruction from the College of Agriculture to the people living some distance from it. So far this instruction has been given principally in schools of Agriculture and Home Making, each conducted for one week. The Agricultural Extension school is secured upon the application of twenty-five persons. Only one can be granted for a county. The courses offered for a school follow:

ANIMAL HUSBANDRY SCHOOL. Soil Fertility, Farm Crops, and Animal Husbandry.

DAIRY SCHOOL. Soil Fertility, Farm Crops, and Dairying.

HORTICULTURAL SCHOOL. Soil Fertility, Farm Crops, and Horticulture.

Only three courses are given in a school.

HOME MAKERS' COURSE. Cooking, Baking, Canning, Home Decoration, and Home Economics.

No farm or household practices are given except such as are incident to the study of principles.

In addition to conducting schools, demonstrations in the mixing of fertilizers and in the application of spray mixtures are made, agricultural and educational exhibits at important fairs and expositions are supplied, instruction for the Agricultural trains furnished, and special bulletins designed to awaken an interest in agricultural education published.

Nearly five thousand men and women have attended the Agricultural Extension Schools; a few less than twelve thousand have visited the agricultural trains; fifteen thousand farmers, teachers, and children receive bulletins published by this department.

For a bulletin of information concerning these Agricultural Extension Schools, address the University Editor. For information not contained in this bulletin and for information regarding other forms of Extension work, address the Superintendent of Agricultural Extension.

The Ohio State University Bulletin is issued at least fifteen times during the academic year; monthly in October, November, and June, and bi-weekly in December, January, February, March, April, and May.

The Ohio State University Bulletin

College of Agriculture

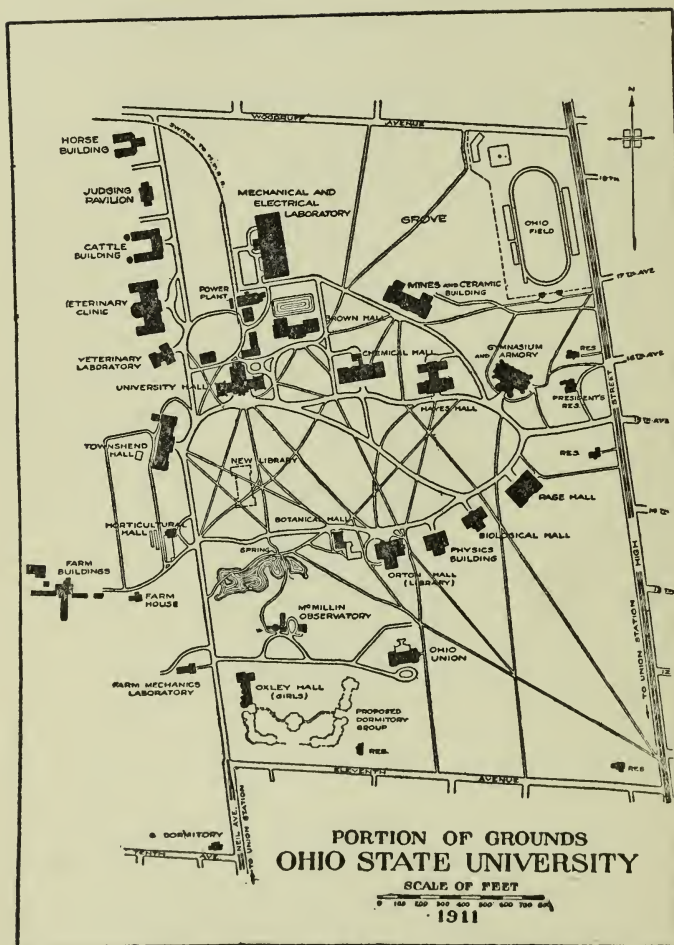


February, 1911

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THE OHIO STATE UNIVERSITY

The Ohio State University, located in Columbus two miles north of the Union Station, is a part of the public educational facilities maintained by the State. It comprises seven colleges:

The College of Agriculture,
The College of Arts, Philosophy, and Science,
The College of Education,
The College of Engineering,
The College of Law,
The College of Pharmacy,
The College of Veterinary Medicine.

This bulletin of announcements is devoted exclusively to the work of the College of Agriculture, offered during the academic year, beginning September, 1911.

[NOTE—The University publishes a bulletin descriptive of each college. Copies may be obtained by addressing W. E. Mann, University Editor, Columbus, Ohio, and stating the college in which the writer is interested.]

UNIVERSITY CALENDAR

1911

Entrance examinations (8 a. m.), Tuesday to Saturday,
June 6 to 10.

Summer Session, June 19 to August 11.

Entrance examinations (8 a. m.), Tuesday to Saturday,
September 5 to 9.

First semester begins—Registration Day—Tuesday, Sep-
tember 12.

President's Annual Address (11 a. m.), Friday, Septem-
ber 15.

Latest date of admission to candidacy for a degree at the
Commencement of June, 1912, Monday, October 2.

Date for mid-semester reports to the Deans concerning
delinquent students, Saturday, November 18.

Thanksgiving recess begins November 29 (6 p. m.), and
ends December 4 (8 a. m.).

Christmas recess begins Friday, December 22 (6 p. m.).

1912

Christmas recess ends Tuesday, January 2 (8 a. m.).

Winter Course in Agriculture and Dairying begins Tues-
day, January 2.

First semester ends Thursday, February 1 (6 p. m.).

Second semester begins—Registration Day—Tuesday,
February 6.

Washington's Birthday, Thursday, February 22.

Date for mid-semester reports to the Deans concerning
delinquent students, Saturday, March 30.

Competitive Drill—Cadet Regiment—Saturday, May 25.

Memorial Day, Thursday, May 30.

Final examinations, Friday to Thursday, May 31 to
June 6.

Entrance examinations (8 a. m.), Tuesday to Saturday,
June 4 to 8.

Commencement, Wednesday, June 12.

COLLEGE OF AGRICULTURE

The College of Agriculture offers eight distinct courses of study:

1. A four-year course in Agriculture.
2. A four-year course in Horticulture.
3. A four-year course in Forestry
4. A four-year course in Domestic Science.
5. A two-year course in Agriculture.
6. A two-year course in Horticulture.
7. A winter course in Dairying.
8. An eight-week winter course in Agriculture.

The four-year courses of this College are regular collegiate courses of the University and lead to the degrees of Bachelor of Science in Agriculture, Bachelor of Science in Horticulture, Bachelor of Science in Forestry, and Bachelor of Science in Domestic Science. The requirements for admission to these courses are given in the following pages.

The short courses are for students who are not so well prepared and are unable to spend four years in the University. It has been found, however, that a large proportion of those who enter the short courses find time and means to continue one of the four-year courses.

FACULTY AND INSTRUCTORS

WILLIAM OXLEY THOMPSON, D. D., LL.D., PRESIDENT
of the University.

*HOMER CHARLES PRICE, M. S. A., DEAN, Professor of
Rural Economics and Manager of University Farm.

HARRY CLIFFORD RAMSOWER, B. Sc. (Agr.), SECRETARY,
Assistant Professor of Agronomy.

*Absent on leave, 1911-1912.

DEPARTMENTS REPRESENTING THE TECHNICAL WORK OF THE COLLEGE

Agricultural Chemistry.

ALFRED VIVIAN, Ph. G., Professor.

HENRY ADAMS WEBER, Ph. D., Professor.

JOHN F. LYMAN, Ph. D., Associate Professor.

FRANCES FREEMAN, B. Sc. (Dom. Sc.), Fellow.

*FIRMAN E. BEAR, M. Sc. (Agr.), Assistant Professor.

*ORVILLE M. JOHNSON, B. Sc. (Agr.), Assistant.

*PORTER ELLIOTT, B. Sc. (Agr.), Assistant.

*FRANK A. WELTON, B. Sc., Assistant.

Agronomy.

ARTHUR GILLET McCALL, B. Sc. (Agr.). Professor.

HARRY CLIFFORD RAMSOWER, B. Sc. (Agr.), Assistant Professor.

*ERNEST D. WAID, B. Sc. (Agr.), Assistant Professor.

*GEORGE LIVINGSTON, B. Sc. (Agr.), Assistant.

*W. HOLDEN DARST, B. Sc. (Agr.), Assistant.

HARLEY J. BOWER, B. Sc. (Agr.), Assistant.

CLIFFORD J. GRANT, B. Sc. (Agr.), Assistant.

*DAVID W. GALEHOUSE, Assistant.

Animal Husbandry.

CHARLES SUMNER PLUMB, B. Sc. Professor.

FREDERICK RUPERT MARSHALL, B. Sc. (Agr.), Professor.

HENRY WILLIAM VAUGHAN, M. Sc. (Agr.), Assistant Professor.

*GEORGE F. STORY, B. Sc. (Agr.), Assistant.

*HARRY P. EVANS, B. Sc. (Agr.), Assistant.

DAVID MAXWELL FYFFE, Superintendent.

Agricultural Extension.

ALBERT B. GRAHAM, Superintendent.
CALVIN R. TITLOW, Assistant.
CHRISTOPHER D. STEINER, Assistant.
HARRY E. ESWINE, Assistant.
GARLAND A. BRICKER, M. A., Assistant.

Dairying.

OSCAR ERF, B. Sc. (Agr.), Professor.
OMER COLE CUNNINGHAM, B. Sc. (Agr.), Instructor.
WILLIAM L. CLEVINGER, B. Sc. (Agr.), Instructor.
*ARTHUR S. NEALE, B. Sc. (Agr.), Assistant.
*FRANK EDWARD RINEHART, B. Sc. (Agr.), Assistant.

Domestic Science.

RUTH A. WARDALL, M. A., Professor.
EDNA NOBLE WHITE, B. A., Associate Professor.
ANNA KATHERINE FLINT, B. Sc., Associate Professor.
ANNA FRANCES BLOHM, B. A., Assistant.
IDA M. SHILLING, B. Sc. (Dom. Sc.), Assistant.
*MARY EDMONDS, B. Sc. (Dom. Sc.), Assistant.
*ELIZABETH JEFFERSON, B. Sc. (Dom. Sc.), Assistant.
*INEZ VAN SICKLE, B. Sc. (Dom. Sc.), Assistant.
*MABEL MISKIMEN, B. Sc. (Dom. Sc.), Assistant.
*NELLIE WOODS, B. Sc. (Dom. Sc.), Assistant.
*CLARE WEST, B. Sc. (Dom. Sc.), Assistant.

Forestry.

†WILLIAM R. LAZENBY, M. Agr., Professor.
CHRISTIAN H. GOETZ, B. Sc., Instructor.

Horticulture.

WENDELL PADDOCK, M. Sc., Professor.

†Absent on leave, 1911-1912.

VERNON HAYES DAVIS, M. S. A., Assistant Professor.
LEWIS M. MONTGOMERY, M. Sc. (Agr.), Assistant Professor.

*JOSEPH H. GOURLEY, B. Sc. (Agr.), Assistant Professor.

Rural Economics.

HOMER CHARLES PRICE, M. S. A., Professor.
J. WARREN SMITH, Professor of Meteorology.
THOMAS D. PHILLIPS, B. Sc. (Agr.), Assistant.
JOHN CHISHOLM, B. S. A., Superintendent of University Farm.

Those marked with (*) in Horticulture, Agricultural Chemistry, Animal Husbandry, Agronomy, Domestic Science, and Dairying, are employed in the Extension Department.

DEPARTMENTS OF GENERAL SCIENCE FUNDAMENTAL TO THE WORK OF THE
COLLEGE OF AGRICULTURE

Anatomy and Physiology.

ALBERT MARTIN BLEILE, M. D., Professor.
RAYMOND JESSE SEYMOUR, M. S., M. D., Associate Professor.
EDWIN POE DURRANT, M. A., Assistant Professor.

Bacteriology.

CHARLES BRADFIELD MORREY, B. A., M. D., Professor.
EUGENE FRANKLIN McCAMPBELL, B. Sc., Professor.

Botany.

JOHN H. SCHAFFNER, M. S., Associate Professor.
ALFRED PAUL DACHNOWSKI, Ph. D., Assistant Professor.
ROBERT FISKE GRIGGS, B. Sc., M. A., Assistant Professor.

Chemistry.

WILLIAM MCPHERSON, Ph. D., Professor.

WILLIAM LLOYD EVANS, Ph. D., Associate Professor.

JAMES RENWICK WITHROW, Ph. D., Associate Professor.

Geology.

CHARLES SMITH PROSSER, Ph. D., Professor.

JOHN ADAMS BOWNOCKER, D. Sc., Professor.

THOMAS MCDUGALL HILLS, Ph. D., Assistant Professor.

Veterinary Medicine.

DAVID STUART WHITE, D. V. S., Professor.

SEPTIMUS SISSON, S. B., Professor.

FONSA ALLEN LAMBERT, D. V. M., Assistant Professor.

Zoology.

HERBERT OSBORN, M. Sc., Professor.

FRANCIS LEROY LANDACRE, B. A., Professor.

JAMES STEWART HINE, B. Sc., Associate Professor.

Mathematics.

ROSSER DANIEL BOHANNAN, B. Sc., C. E., E. M., Professor.

KARL DALE SWARTZEL, M. Sc., Professor.

CHARLES LINCOLN ARNOLD, M. Sc., Associate Professor.

Physics.

ROBERT F. EARHART, Ph. D., Associate Professor.

HERMAN GUSTAVUS HEIL, Ph. B., Instructor.

DEPARTMENTS REPRESENTING OTHER RE-
QUIRED WORK OF THE COLLEGE

American History.

GEORGE WELLS KNIGHT, Ph. D., Professor.

HOMER C. HOCKETT, B. L., Associate Professor.

Art.

MRS. MARY REBECCA LAVER, Professor.

Civil Engineering.

CHRISTOPHER ELIAS SHERMAN, C. E., Professor.

Economics and Sociology.

JAMES E. HAGERTY, Ph. D., Professor.

MATTHEW BROWN HAMMOND, Ph. D., Professor.

FAYETTE AVERY MCKENZIE, Ph. D., Associate Professor.

CHARLES CLIFFORD HUNTINGTON, M. A., Assistant Professor.

English.

JOSEPH VILLIERS DENNEY, M. A., Professor.

GEORGE H. MCKNIGHT, Ph. D., Professor.

WILLIAM LUCIUS GRAVES, M. A., Associate Professor.

HARRY FRANKLIN HARRINGTON, M. A., Assistant Professor.

Engineering Drawing.

THOMAS EWING FRENCH, M. E., Professor.

ROBERT MEIKLEJOHN, M. E., Assistant Professor.

German.

BERTHOLD AUGUST EISENLOHR, M. A., Associate Professor.

MAY THOMAS, Ph. D., Assistant Professor.

Industrial Arts.

FRANK EDWIN SANBORN, S. B., Professor.

CLEMENT C. BEEM, Instructor.

CHARLES PHILIP CROWE, Instructor.

Romance Languages.

BENJAMIN LESTER BOWEN, Ph. D., Professor.

CHARLES A. BRUCE, B. A., Professor.

EDGAR SHUGERT INGRAHAM, Ph. D., Associate Professor.

MISCELLANEOUS

Architecture.

JOSEPH NELSON BRADFORD, M. E., Professor.

CHARLES ST. JOHN CHUBB, C. E., Associate Professor.

Library.

OLIVE JONES, B. A., Librarian.

Military Science.

CAPTAIN GEORGE L. CONVERSE, U. S. A. (Ret.),
Professor.

Physical Education for Men.

H. SHINDLE WINGERT, M. D., Professor.

Physical Education for Women.

ALICE LITTLEJOHN, M. D., Associate Professor.

DORA SAUER, Assistant.

ADMISSION

Applicants for admission must be at least sixteen years of age. The College is open on equal terms to both sexes.

UNIVERSITY ENTRANCE BOARD

The admission of students is in charge of the University Entrance Board, which determines the credits which shall be issued on all entrance examinations and certificates, and furnishes all desired information to applicants. Correspondence relating to admission should be addressed to the Entrance Board, Ohio State University, Columbus.

ADMISSION TO THE COURSE LEADING TO A DEGREE.

There are two modes of admission to the course leading to a degree: (a) by certificate, (b) by examination.

ADMISSION BY CERTIFICATE

Applicants may be admitted to the four-year course in Agriculture and to the four-year courses in Horticulture and Forestry without examinations on presentation of properly endorsed certificates from any first or second grade high school in this state, or from approved normal schools or from the State Board of School Examiners or from any school outside of the state which is recognized by the University, under the following provisions:

(a) If from secondary schools, the certificate must show that the applicant is a graduate in good standing of the school issuing it; and also must state in detail the studies pursued, the text-books used, the amount of work done in each study, the amount of time devoted to it, and the fact that the applicant has passed in the work.

(b) Any entrance requirement not covered by a certificate must be met by examination.

Blank certificates may be obtained by addressing the Secretary of the Entrance Board. Certificates should be filled out and returned to the University by the proper school official as early as possible after the close of schools in June.

Applicants to be admitted to the course in Domestic Science without examination must present properly endorsed certificates from such secondary schools as have been accredited or recognized by the University or from approved normal schools or from the State Board of School Examiners, subject to the provisions above stated.

ADMISSION BY EXAMINATION

The Entrance Board will conduct entrance examinations June 6 to 10, and September 5 to 9, 1911. A part of the examinations may be taken in June and the remainder in September. All applicants for admission who cannot conform to the requirements for admission by certificate must take examinations for admission.

SCHEDULE—Examinations will be from 8 to 12 a. m. and from 1 to 5 p. m.

Applicants must register with the Entrance Board (Room 100), University Hall, before examinations.

Tuesday,	A. M.	History: Greek and Roman, English, General.
Tuesday,	P. M.	Composition and Rhetoric, Classics, Chemistry, Geology.
Wednesday,	A. M.	Algebra, German, English Grammar, Descriptive Geography.
Wednesday,	P. M.	Plane Geometry, Physical Geography, Arithmetic.
Thursday,	A. M.	Civics, Solid Geometry, Zoology.
Thursday,	P. M.	Beginning Latin, Cæsar, Astronomy, Elements of Agriculture.
Friday,	A. M.	Physics, Physiology, Botany.
Friday,	P. M.	U. S. History, French, English Literature.
Saturday,	A. M.	Vergil, Cicero, Domestic Science.

REQUIREMENTS BY UNITS*

A unit is the equivalent of a course of study covering a school year, during which not less than one hundred and twenty clock-hours are spent in class-room work on the study. To obtain full standing applicants under twenty-one years of age must have credit by examination or certificate for twelve units (and in the course of Domestic Science fifteen units) of which two shall be English, two foreign language (in Domestic Science three units of English and four foreign language), two Mathematics, one History, and one Physics, selected from the following list:

*A special bulletin of entrance information will be mailed on request. Address the **University Editor**.

English	3 units
(Foreign students may substitute their native language for the English requirement.)	
American History or American History and Civil Government	1 unit
Ancient History (Greek and Roman) and Medieval History to 814 A. D.....	1 unit
Medieval and Modern History (from 814 A. D. to the present)	1 unit
(For the present General History may be counted as a unit, but not in addition to Ancient or Medieval and Modern History.)	
English History	1 unit
Algebra (through quadratics)	1 unit
Algebra (beyond quadratics)	$\frac{1}{2}$ unit
Geometry (plane)	1 unit
Geometry (solid)	$\frac{1}{2}$ unit
Trigonometry	$\frac{1}{2}$ unit
Latin	2, 3, or 4 units
Greek	2, 3, or 4 units
German	2, 3, or 4 units
French	2, 3, or 4 units
Spanish	2, 3, or 4 units
(Not less than two units of any language will be accepted.)	
Physics	1 unit
Chemistry	1 unit
Physical Geography.....	1 unit
Zoology	1 unit
Botany	1 unit
Physical Geography	} For the present any two of these may be counted together as
Zoology	
Botany	
Physiology	
Agriculture	} The Entrance Board may, after investigating each claim, grant a total credit of not to exceed
Manual Training	
Free-hand Drawing	
Domestic Science	
	2 units

Preparation in excess of the requirement in any subject will not be credited unless it amounts to one-half unit.

No student under twenty-one years of age will be admitted to college if he is conditioned in more than two units. All entrance conditions must be removed within two years after admission.

Students over twenty-one years of age, after obtaining credit for elementary or "grade" work, and for such other subjects as may be necessary to qualify them for the classes that they wish to enter may, on the presentation of satisfactory reasons, be admitted by the joint action of the Entrance Board and the Executive Committee of the College, to any class in the College, provided that if any student who has been admitted on these conditions afterwards becomes a candidate for a degree, he shall take the omitted entrance examinations at least one academic year before the degree is conferred, or, in lieu thereof, the Entrance Board may substitute excess work in other approved subjects (Faculty Rule 97).

ADMISSION WITH ADVANCED STANDING

Applicants who have completed at least one year's work in an approved college, and who bring official and explicit certificates describing their courses of study and scholarship, and letters of honorable dismissal, will be admitted in accordance with either of two plans:

(1) The entrance units on which the candidate was admitted to the approved college will be accepted at their face value; deficiencies will be made up from the college credits presented, and advanced credit will be given for any remaining satisfactory work; or

(2) One year's work will be accepted in lieu of entrance units and the candidates will be admitted without examination and without conditions, but without any advanced standing on the year's work.

Applicants who have completed less than one year's work in an approved college will be given credit for satisfactory work provided they can meet regular entrance requirements.

REQUIREMENTS FOR SHORT COURSES

No examinations will be required for the two-year courses in Agriculture or Horticulture, but the applicant must be at least seventeen years of age and must satisfy the Entrance Board that he has had practical experience in agriculture or horticulture. This practical experience is interpreted as meaning one year of actual farm life. In addition to this the Entrance Board may require the candidate to submit a letter from the Principal or Superintendent of the school last attended, recommending him to the University.

COURSES OF STUDY

AGRICULTURE

The course in Agriculture is one of a number of regular four-year collegiate courses in the University. It is designed not only to make specially trained agriculturists, but also educated men. The course pre-supposes that a young man has had a high-school training, or its equivalent, and that he has had the training in farm matters that usually comes to a young man who has lived on a farm. It supplements this training but does not repeat it. The technical training in this course consists of those matters which years of experience in teaching have shown are either lacking or most necessary. Young men from the cities are entering this course, as they should do if they expect to engage in agricultural pursuits, but it should be understood that the course in Agriculture does not, except incidentally, supply that training in farm matters which comes from actual life upon the farm. Such a course could be readily planned, but it would waste that valuable time of nine-tenths of the students who now enter the course.

The officers of the College recognize the danger of a too special or technical training of under-graduate students in a subject having such a wide scope and one requiring for its successful prosecution such breadth of knowledge as agriculture. A careful examination of the course as outlined will show that about one-third of the time of the student during the four years is, or may be, devoted to language (English and foreign), history, and economics, about one-third to pure science, and one-third to technical or professional training. Electives in the junior and senior years allow the student, if he chooses, to specialize in animal husbandry, agronomy, dairying, rural economics, agricultural chemistry, bacteriology, botany, or entomology.

No man or woman is well educated until he or she has been taught both to do and to think. Both faculties are necessary and each assists the other. Experience and reason, however, show that the students who enter the courses in agriculture have been better trained in doing than in thinking. With them manual training is not so necessary, as an educational factor, as with students from the cities. However, special emphasis is laid on training the faculties of observation, reason, and judgment. The laboratory methods and facilities are most thorough and complete in all scientific and technical courses, giving a training which cannot be obtained merely from books.

COURSE IN AGRICULTURE

Degree—Bachelor of Science in Agriculture.

NOTE—The figure in parenthesis following the name of each subject indicates the number of that subject in its department, the other figure the number of credit hours. For full description of the courses, see corresponding numbers under the departments of instruction.

FIRST YEAR

FIRST SEMESTER.		SECOND SEMESTER.	
Chemistry (105 or 109)	4.	Chemistry (106 or 110)	4.
Inorganic.		Qualitative.	
Zoology (101)	3.	Zoology (102)	3.
Invertebrate.		Vertebrate.	
English (101)	2.	English (104)	2.
Paragraph Writing.		Brief Making.	
Animal Husbandry (101)	4.	Animal Husbandry (102)	4.
Cattle and Sheep.		Horses and Swine.	
Drawing (125)	2.	Geology (152)	3.
Shopwork (101)	2.	Shopwork (104)	2.
Cadet Service	1.	Cadet Service	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

FIRST SEMESTER.		SECOND SEMESTER.	
Geology (153)	3.	Agronomy (104)	4.
Agricultural Chem. (103)	5.	Agricultural Chem. (104)	5.
Botany (101)	4.	Botany (102)	4.
Physiology (101)	3.	Physiology (102)	3.
Zoology (107)	3.	Zoology (108)	3.
Entomology.		Entomology.	
Bibliography	½.	Cadet Service	1.
Cadet Service	1.		

THIRD YEAR

FIRST SEMESTER.		SECOND SEMESTER.	
Agronomy (101)	4.	Agronomy (106)	4.
Dairying (101)	4.	Horticulture (118)	4.
Modern Language	4.	Modern Language	4.
French, German, or Spanish.		French, German, or Spanish.	
Meteorology (101)	2.		

And one of the following:

Animal Husbandry (103)	4.	Animal Husbandry (104)	4.
Veterinary Medicine (149)	3.	Veterinary Medicine (150)	3.
Forestry (*)	4.	Dairying (102)	4.
Zoology (113)	4.	Zoology (114)	4.
Entomology.		Entomology.	
Bacteriology (107)	4.	Bacteriology (110 or 112)	4.
Agricultural Chem. (*)	4.	Agricultural Chem. (*)	4.
Botany (*)	3 or 4.	Botany (*)	3 or 4.
Agronomy (107)	4.	Agronomy (102)	3.
Animal Husbandry (105)	3.	Animal Husbandry (106)	4.
		Meteorology (102)	2.

FOURTH YEAR

FIRST SEMESTER.

American History (101) or
 Economics (135) 3.
 Rural Economics (103) 4.
 Farm Management.

SECOND SEMESTER.

American History (102) or
 Economics (136) 3.
 Rural Economics (104) 3.
 Agricultural Economics.

ELECTIVE

Ten hours a week throughout the year from any of the courses given in any of the colleges of the University upon which the student is qualified to enter, except the College of Law. Two hours a week of this elective work may be devoted to a thesis, subject to the consent of the instructor under whom the thesis is to be written.

*Students electing Agricultural Chemistry, Botany, or Forestry in their junior year should consult the department interested regarding the same before being registered.

HORTICULTURE

This course was established to meet a growing demand for special education and training in the College of Agriculture. It seeks to familiarize the student with those sciences that are fundamental in horticulture and to give a certain amount of technical and literary training.

Among the sciences that form the natural basis of a sound, practical knowledge of horticulture are chemistry, physics, botany, geology, zoology, and entomology. To these a large part of the first two years of the course is devoted. In addition, one modern language, rhetoric or English composition, drawing and shopwork are required.

The last two years of the course are devoted mainly to horticulture proper, with some more strictly cultural studies like history or economics. A third part of the required work of the fourth year is elective, and may be chosen from any course in the University upon which the student is qualified to enter.

The primary object of the course is to teach those who desire to become fruit-growers, gardeners, nurserymen, florists, or landscape gardeners, what they most need to know as a foundation for their professional work. To this end both the science and art, or the theory and practice, are taught. While the sciences are invaluable in giving accurate and definite knowledge regarding the origin and growth of plants, and the composition and physical properties of the soil, they cannot tell us just how to select varieties, or how to propagate, transplant, cultivate, fertilize, prune, spray, or what is equally essential in practice, how to harvest, store and market the product to the best advantage.

For earnest, enterprising young men and women, horticulture, in its various branches, offers as large a reward for intelligent, well directed effort as any other pursuit or profession.

COURSE IN HORTICULTURE

Degree—Bachelor of Science in Horticulture.

NOTE—The figure in parenthesis following the name of each subject indicates the number of that subject in its department; the other figure the number of credit hours. For full description of courses, see corresponding number under the departments of instruction.

FIRST YEAR

FIRST SEMESTER.		SECOND SEMESTER.	
Chemistry (105 or 109)	4.	Chemistry (106 or 110)	4.
Inorganic.		Qualitative.	
Zoology (101)	3.	Zoology (102)	3.
Invertebrate.		Vertebrate.	
English (101)	2.	English (104)	2.
Paragraph Writing.		Brief Making.	
Horticulture (101)	4.	Horticulture (102)	4.
Principles.		Principles.	
Drawing (125)	2.	Geology (152)	3.
Shopwork (101)	2.	Shopwork (104)	2.
Cadet Service	1.	Cadet Service	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

FIRST SEMESTER.		SECOND SEMESTER.	
Horticulture (103)	3.	Horticulture (104)	3.
Agricultural Chem. (103)	5.	Agricultural Chem. (104)	5.
Geology (153)	3.	Agronomy (104)	4.
Zoology (107)	3.	Zoology (108)	3.
Economic.		Economic.	
Botany (101)	4.	Botany (102)	4.
Bibliography	½.	Cadet Service	1.
Cadet Service	1.		

THIRD YEAR

FIRST SEMESTER.		SECOND SEMESTER.	
Horticulture (105)	4.	Horticulture (106)	4.
Modern Language	4.	Modern Language	4.
French, German, or Spanish.		French, German, or Spanish.	
Physiology (101)	3.	Physiology (102)	3.
Botany (125)	4.	Botany (126)	4.
Meteorology (101)	2.	Horticulture (108)	3.

FOURTH YEAR

FIRST SEMESTER.		SECOND SEMESTER.	
American History (101) or		American History (102) or	
		U. S. Political.	
Economics (135)	3.	Economics (136)	3.
Horticulture (109)	3.	Horticulture (110)	3.
Horticulture (107)	3.	Botany (116)	3.

ELECTIVE

Seven hours a week through the year, chosen from any of the courses given in any college of the University upon which the student is qualified to enter, except the College of Law, two hours a week of which may be devoted to thesis, subject to the approval of the department in which the thesis is to be written.

FORESTRY

The main objects in the establishment of a four-year course in Forestry are: (1) To educate and train young men in forestry; (2) To promote forestry in the State of Ohio.

The facilities for becoming well grounded in the fundamental and accessory studies are provided in the various departments of the University. Language, mathematics, chemistry, engineering, botany, geology, entomology, soil physics, meteorology, etc., form a large

part of the work of the first two years of the course, while the last two years are devoted to the more technical subjects.

It is the aim of the department to reach two classes of students: First, those who purpose to make forestry their life work. Second, those who, while specializing in other courses, desire to acquaint themselves with the elements or with certain phases of the general subject.

The regular course seeks to prepare the student not only for practical work in the woods, but for national and state service in various lines; for consultation work for lumbermen, railroad companies, water-works, park commissions and private owners.

To those who enjoy outdoor life, and are willing to undergo vigorous tests of mental and physical strength, forestry presents an especially inviting field. The remuneration compares favorably with that of other salaried professions, and the opportunities for private enterprise are wide and varied.

The art of forestry has made such progress in our country, that it is sometimes advisable to specialize in certain well defined branches of the subject.

Opportunity for special work, in addition to what is included in the regular course, is offered in silviculture, forest management, and arboriculture.

Facilities for original and research work in scientific forestry are found in the various scientific and engineering laboratories of the University.

COURSE IN FORESTRY

Degree—Bachelor of Science in Forestry.

NOTE—The figure in parenthesis following the name of each subject indicates the number of that subject in its department; the other figure the number of credit hours. For full description of

courses, see corresponding number under the departments of instruction.

FIRST YEAR

FIRST SEMESTER.

Chemistry (105 or 109)	4.
Mathematics (121)	3.
Modern Language (101)	4.
French, German, or Spanish.	
English (101)	2.
Engineering Drawing (101)	4.
Forestry (101)	2.
Elementary.	
Cadet Service	1.
Gymnasium	1.

SECOND SEMESTER.

Chemistry (106 or 110)	4.
Mathematics (122)	3.
Modern Language (102)	4.
French, German, or Spanish.	
English (104)	2.
Forestry (102)	2.
Elementary.	
Botany (110)	2.
Dendrology.	
Cadet Service	1.
Gymnasium	1.

SECOND YEAR

FIRST SEMESTER.

Botany (101)	4.
Zoology (109)	3.
Entomology.	
Modern Language (103)	4.
French, German, or Spanish.	
Civil Engineering (121)	6.
Surveying.	
Bibliography	1½.
Cadet Service	1.

SECOND SEMESTER.

Botany (102)	4.
Zoology (110)	3.
Entomology.	
Modern Language (104)	4.
French, German, or Spanish.	
Forestry (104)	3.
Arboriculture.	
Geology (152)	3.
Cadet Service	1.

THIRD YEAR

FIRST SEMESTER.

Forestry (105)	3.
Silviculture.	
Botany (117)	4.
Forest.	
Geology (153)	3.
Meteorology (101)	2.

SECOND SEMESTER.

Forestry (106)	3.
Silviculture.	
Botany (118)	4.
Forest.	
Agronomy (104)	4.
Elementary Soils.	

Not less than five hours throughout the year from the following:

Physics (105)	4.	Physics (106)	4.
Agricultural Chem. (103)	5.	Agricultural Chem. (104)	5.
Bacteriology (107)	4.	Bacteriology (110)	4.
Zoology (113)	4.	Zoology (114)	4.
Engineering Drawing (137)	2.	Engineering Drawing (138)	2.
Economics (135)	3.	Horticulture (108)	3.
Agronomy (107)	4.	Economics (136)	3.

FOURTH YEAR

FIRST SEMESTER.		SECOND SEMESTER.	
Forestry (107)	4.	Forestry (108)	4.
Mensuration, Valuation, Wood Technology.		Utilization and Lumbering.	
Forestry (109)	4.	Forestry (110)	4.
History and Management.		Policies and Economics.	
Botany (125)	4.	Botany (126)	4.
Physiological Ecology.		Physiological Ecology.	

Not less than five hours throughout the year from any course offered by the University upon which the student is qualified to enter.

Unless the candidate for a degree has had a full equivalent, not less than one summer of practical work in the woods is required before graduation.

TWO-YEAR COURSE IN AGRICULTURE

The Short Course in Agriculture is a two-year course, designed to give practical instruction in the various branches of agriculture, and is intended primarily for those students whose previous training does not qualify them to enter the four-year course. While believing that the four-year course is none too long for the students who expect to engage in agricultural pursuits, it is recognized that there are many students whose circumstances make it impossible to take a four-year collegiate course in agriculture, and yet who would be greatly benefited by taking a less extended training for their life work.

This course is especially desirable for students of rather mature age. It contains as thorough instruction as the time will admit in agronomy, animal husbandry, dairying, horticulture (including fruit culture and vegetable gardening), forestry, veterinary medicine, economic entomology, bacteriology, and the sciences underlying these subjects. The second year contains optional work so that it is possible for students to specialize in horticulture, agronomy, animal husbandry, or dairying.

No degree is given on the completion of the work, but a certificate is issued stating fully the work done.

OUTLINE OF TWO-YEAR COURSE IN AGRICULTURE

NOTE—The figure in parenthesis following the name of each subject indicates the number of that subject in its department; the other figure the number of credit hours. For full description of courses, see corresponding number under the departments of instruction.

FIRST YEAR

FIRST SEMESTER.		SECOND SEMESTER.	
Animal Husbandry (129)	4.	Animal Husbandry (130)	4.
Horticulture (111)	4.	Horticulture (112)	4.
Shopwork (101)	2.	Shopwork (104)	2.
Agronomy (103)	4.	Agronomy (108)	4.
Chemistry (101)	4.	Chemistry (102) or	
Elementary.		Agricultural Chem. (102)	4.
		Soil Fertility.	
Cadet Service	1.	Cadet Service	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

FIRST SEMESTER.		SECOND SEMESTER.	
Agronomy (105)	4.	Rural Economics (102)	4.
Dairying (109)	4.	Dairying (102)	4.
Elementary.		Farm Dairying.	
Cadet Service	1.	Cadet Service	1.
And two subjects each semester chosen from the following:			
Veterinary Medicine (149)	3.	Veterinary Medicine (150)	3.
Animal Husbandry (123)	4.	Animal Husbandry (128)	4.
Dairy Cattle.		Feeding and Breeding.	
Horticulture (113)	4.	Horticulture (114)	4.
Pomology.		Pomology.	
Zoology (109)	4.	Zoology (110)	4.
Entomology.		Entomology.	
Physiology (103)	3.	Bacteriology (104)	3.
Mathematics (103)	5.	Mathematics (104)	5.
Algebra.		Botany (102)	4.
Physics (101)	6.	Elementary.	
Forestry ()	3.	Geology (162)	4.
		Physical Geography.	

TWO-YEAR COURSE IN HORTICULTURE

This course is intended to be to those engaged in horticultural pursuits what the two-year course in agriculture is to those interested in farming. Practical instruction will be given in the subjects which are of interest to the fruit-growers, gardeners, nurserymen, florists,

and landscape gardeners. The course is primarily for the student who, for various reasons, cannot take the four-year course in Horticulture and yet desires to have a somewhat thorough preparation in the fundamentals of horticulture.

No degree is given on completion of the work, but a certificate is issued stating fully the work done.

OUTLINE OF TWO-YEAR COURSE IN HORTICULTURE

FIRST YEAR

FIRST SEMESTER.		SECOND SEMESTER.	
Horticulture (111)	4.	Horticulture (112)	4.
Zoology (109)	4.	Zoology (110)	4.
Entomology.		Entomology.	
Shopwork (101)	2.	Shopwork (104)	2.
Chemistry (101)	4.	Chemistry (102) or	
Elementary.		Agricultural Chem. (102)	4.
Agronomy (103)	4.	Soil Fertility.	
Cadet Service	1.	Botany (112)	4.
Gymnasium	1.	Cadet Service	1.
		Gymnasium	1.

SECOND YEAR

FIRST SEMESTER.		SECOND SEMESTER.	
Horticulture (113)	4.	Horticulture (114)	4.
Pomology.		Pomology.	
Horticulture (115)	4.	Horticulture (116)	4.
Agronomy (105)	4.	Rural Economics (102)	4.
Cadet Service	1.	Cadet Service	1.
One of the following:			
Forestry	4.	Horticulture	4.
Mathematics (103)	5.	Mathematics (104)	5.
Algebra.		Bacteriology (104)	3.
Physics (101)	5.	Geology (162)	4.
Physiology (103)	3.	Physical Geography.	

WINTER COURSES

THE OHIO DAIRY SCHOOL

This course in Dairying is established to meet the wants of those who have neither the time nor means for more extended courses. It is designed especially for

those who are desirous of mastering the art of butter and cheese making or who wish to become fitted for the position of manager or superintendent of a creamery or cheese factory. In this course the greater part of the time is given to the laboratory or dairy room practice. This consists in the testing of milk as to purity and content of butter fat; the use and care of centrifugal separators and other dairy devices; the making of butter and cheese by the most improved methods; in short, all the essential operations of the creamery, factory, and home dairy management are repeatedly performed under the guidance and direction of competent instructors. A special bulletin describing this course will be mailed, upon application, to any one interested.

WINTER COURSE IN AGRICULTURE

The eight-week Winter Course in Agriculture has been established to meet the demands of those Ohio farmers who are unable to avail themselves of the other courses in agriculture offered by the University. There is a large number of young men located on the farms of our state who are so situated that it is impossible for them to be absent from their homes during the nine months of the college year, but yet desire some training in the principles of agriculture. On other farms are found mature men who are past the usual school age but are ambitious to become familiar with the most recent agricultural thought and practices.

This course offers to such men an opportunity to become familiar with the results of the latest investigation in research and their practical application to work on the farm.

Those who are interested are invited to write for the special announcement describing this course.

DOMESTIC SCIENCE

The course in domestic science is planned to meet the special needs of women students. Four years of regular university work are required. The department of Domestic Science stands for a liberal training of a university grade, which gives a homeward trend to the education of young women.

The course is essentially scientific in character, but a fair amount of literary, artistic, and economic training is provided. Certain courses offered in this department are elective for students who specialize along other lines of work. The prescribed course affords opportunity for a student to specialize in domestic science, and elective courses in addition to this provide training for those who wish to teach the subject. Students desiring to enter this course will be required to present fifteen units entrance requirements.

OUTLINE OF COURSE IN DOMESTIC SCIENCE

Degree—Bachelor of Science in Domestic Science.

NOTE—The figure in parenthesis following the name of each subject indicates the number of that subject in its department; the other figure the number of credit hours. For full description of courses, see corresponding number under the departments of instruction.

FIRST YEAR

FIRST SEMESTER.		SECOND SEMESTER.	
Chemistry (105 or 109)	4.	Chemistry (106 or 110)	4.
Art (101)	2.	Art (102)	2.
English (101)	2.	English (104)	2.
Zoology (101) or		Zoology (102) or	
Botany (101)	3 or 4.	Botany (102)	3 or 4.
Modern Language (101)	4.	Modern Language (102)	4.
French, or German.		French, or German.	
Domestic Art (101)	2.	Domestic Art (102)	2.
Hand Craft.		Textiles.	
Physical Training	1.	Physical Training	1.

SECOND YEAR

FIRST SEMESTER.		SECOND SEMESTER.	
Chemistry (127)	5.	Economics (138)	5.
Organic.			
Domestic Science (101)	4.	Domestic Science (102)	4.
Physiology (101)	3.	Physiology (102)	3.
Modern Language (103)	4.	Modern Language (104)	4.
French, or German.		French, or German.	
Engineering Draw. (127)	1½.	Engineering Draw. (128)	1½.
Bibliography	½.		
Physical Training	1.	Physical Training	1.

THIRD YEAR

FIRST SEMESTER.		SECOND SEMESTER.	
Sociology (101)	3.	Sociology (102)	3.
GROUP A			
Bacteriology (107)	3 to 5.	Domestic Science (104)	3.
Agricultural Chem. (123)	5.	Agricultural Chem. (124)	5.
GROUP B			
Art (105)	2.	Art (106)	2.
Domestic Art (103)	3.	Domestic Art (104)	3.

Either Group A or Group B may be chosen; one must be taken and both may be. Enough work must be elected with Group A or Group B to make fifteen hours.

FOURTH YEAR

FIRST SEMESTER.		SECOND SEMESTER.	
GROUP A			
Domestic Science (105)	2.	Domestic Science (106)	3 to 5.
Domestic Science (103)	4.		
Domestic Science (107)	3.		
GROUP B			
Philosophy (183)	2.	Philosophy (184)	2.
Art (119)	1.	Art (120)	1.

Enough work must be taken with Group A or Group B, or both, to total less than fifteen hours.

GRADUATE WORK IN COLLEGE OF
AGRICULTURE

Graduate work in the College of Agriculture is particularly planned for those persons who expect to be engaged in College or Experiment Station work, or in the Government Bureaus relating to Agriculture.

It is recognized that the scientific advance in agriculture requires men who are conversant with practical agriculture and the related sciences, and who are also prepared to do research work and to put into good pedagogic form the results of recent investigation.

EQUIPMENT

The University has especially good facilities for advanced work. Intensified agriculture and horticulture throughout the State, and especially in the territory surrounding Columbus, give students unusual opportunity to observe the practical application of science in farming.

The laboratories, a farm of over four hundred acres, the various breeds of farm animals kept on the farm, as well as the numerous excellent herds and flocks available in the vicinity give ample facilities for studying problems in these lines in technical agriculture.

The various orchards and small fruit plantations belonging to the University and accessible within the State show a wide range of methods and the development of a specialized culture.

The instructors in the scientific departments of the University are heartily in sympathy with agricultural work and take great interest in scientific problems of immediate value to agriculture that students take up in the laboratories of these departments. The laboratories in the department of science most intimately connected with work in agriculture and horticulture are provided with extensive collections and apparatus giving excellent opportunity for the investigation of special problems.

REQUIREMENTS FOR DEGREES

The College of Agriculture offers the Graduate Degrees of Master of Science in Agriculture, Horticulture, Forestry, and Domestic Science.

Graduates of the College of Agriculture or of other colleges in which they have had the necessary preparation may be admitted to candidacy for the graduate degree, on approval of the Graduate Committee of the College of Agriculture. Persons admitted to candidacy for the Degree of Master of Science in this College must secure the approval of the heads of the departments in which the work is to be done and of the Graduate Committee of the college. Residence of at least one year at the University wholly devoted to the work is required.

While the qualifications for the Master's Degree is not always contingent upon the completion of a definite number of hours, the amount of work required will usually aggregate not less than 15 credit hours per week, throughout the year in addition to the thesis required.

An acceptable thesis embodying the results of research in the major subject is also required. The completed thesis, type-written and accepted by the professor under whom the work has been done, must be filed with the Graduate Committee on or before the third Thursday before Commencement Day. A final examination shall be held in both the major and minor subject and after the thesis has been approved and accepted, a public oral examination shall be held by the professors under whom the work has been done in both major and minor subjects, and shall be attended by at least one member of the Graduate Committee.

DEPARTMENTS OFFERING GRADUATE WORK

The lines in which the various departments are best prepared to offer graduate work are as follows:

AGRICULTURAL CHEMISTRY

Major graduate work may be taken along the lines of food inspection and analysis, human nutrition, animal nutrition, dairy chemistry or soil chemistry.

AGRONOMY

The graduate courses offered by the Department of Agronomy cover three fields of investigation:

- (1) Crops.
- (2) Soils.
- (3) Agricultural Engineering.

Two special graduate courses in crops are provided, one of which is designed to cover investigations in general crop production and the other to cover plant breeding investigations and other subjects directly related to crop improvement.

The graduate course in soils will include the preparation of monographs on the following topics:

- (1) Soil surveying and mapping.
- (2) The relation of soil types to crop production.
- (3) The influence of certain physical properties upon productive capacity.

ANIMAL HUSBANDRY

Special facilities are available for students who wish to take major work in Animal Husbandry. Each of the members of the department has a special line of research in which students may work or they may be directed in the investigation of any topics selected.

The topics named below can be taken up with particular advantages at this institution:

- (a) Phases of the breeding or the management of dairy cattle.
- (b) Wools and other animal fibres.
- (c) Inheritance in farm animals.
- (d) The breeds of horses.
- (e) Live stock registration.
- (f) Breed history and development.
- (g) Live stock judging.

Work along any one of the above lines can be arranged for minor credit as well as for major.

BACTERIOLOGY.

The courses offered in the Department of Bacteriology of special importance to graduate students in the College of Agriculture are as follows:

- (a) Advanced soil bacteriology, including studies on the bacterial diseases of soils.
- (b) Advanced dairy bacteriology, including studies on the handling of the various dairy products and their preparation.
- (c) Water bacteriology, dealing with the methods of examination and studies on the various methods of filtration.
- (d) Bacteriological chemistry; principally enzyme work.
- (e) Pathogenic bacteriology, with special reference to the disease bacteria in the soil.

BOTANY

Courses are offered by the Department along several lines of especial importance to agricultural students. These courses cover four fields of investigation as follows: (1) plant cytology, including problems of heredity and special studies on chromosomes; (2) plant physiology, emphasis being placed upon the relation of the plant to the soil, together with a study of soil diseases; (3) mycology, including fungous diseases of cultivated plants; (4) systematic botany, with studies on various groups, as grasses, trees, etc.

DAIRYING

Students desiring graduate work in the Department of

Dairying can arrange for work along any of the following lines:

- (a) Formulating rations for the economical production of milk and butter fat.
- (b) The production of sanitary milk in an economical manner.
- (c) The manufacture of butter, especially with reference to increased keeping quality.
- (d) The manufacture of a variety of cheeses.
- (e) Milk condensation.
- (f) The manufacture of fermented milk.
- (g) The manufacture of ice cream.

DOMESTIC SCIENCE

Special problems relating to the household or growing out of conditions in the home may be taken up in this department. These investigations may be along scientific, economic or sociological lines.

GEOLOGY

The Department of Geology offers work open to graduate students of the College of Agriculture along four distinct lines, viz:

- (1) Stratigraphic geology with trips for the field study of Ohio formations supplemented by laboratory study of specimens and literature (Course 105).
- (2) Paleontology, which includes identification and description of the fossils of the Ohio and related formations. (Course 107-108).
- (3) Economic geology describing the metallic ores and the non-metals of the United States. (Course 167).
- (4) Glacial geology in which the glacial deposits of North America are described with field trips for the study of those found in Ohio. (Course 106). Courses 105 and 106 constitute a year's work and are of particular importance in understanding the origin of the soils of Ohio.

RURAL ECONOMICS

Opportunity is offered to carry on special lines of research in farm management, history and literature of agriculture, and in agricultural economics.

ZOOLOGY AND ENTOMOLOGY

The graduate work provided in this department covers especially the courses in Entomology, and in this subject it is possible for students to prepare themselves thoroughly for professional work either in teaching, experiment station work, or for government positions. Many of the graduates of the College are now occupying such positions in many different states, and in the government service. The courses available are Advanced Entomology Nos. 113 and 114, in case this has not been taken as an undergraduate course, and if it has been taken, it may be followed by special research courses Nos. 141 and 142, consisting of research work on entomological problems. The graduate course in Invertebrate Zoology, 247-248, is also available for more thorough preparation upon invertebrates in general.

For graduate students in Animal Husbandry, this department offers a course in quantitative studies in Variation, Heredity, and Animal Behavior, Nos. 129 and 130. In all of these courses the equipment is sufficient to enable the student to do work of an individual and distinctly advanced character.

DEPARTMENTS OF INSTRUCTION

AGRICULTURAL CHEMISTRY

(Townshend Hall)

PROFESSOR VIVIAN, PROFESSOR WEBER, ASSOCIATE PROFESSOR LYMAN,
ASSISTANT PROFESSOR BEAR, MISS FREEMAN, AND ASSISTANTS

The department of Agricultural Chemistry occupies the greater part of the second floor of Townshend Hall. The main students' laboratory is at present fitted up with

one hundred and fifty desks, and will accommodate over two hundred students. Each desk contains a complete outfit of apparatus and chemicals necessary for the work in hand. Special apparatus and chemicals are supplied from the store room. Each desk is equipped with gas and water. Hoods for evaporation and generation of noxious gases and liquids are conveniently arranged on both sides and one end of the laboratory. From the main laboratory, easy access is had to the balance room and private laboratory of the instructor on one side and to the organic analysis and assistant's room and store room on the other. A room entirely detached from the main laboratory is fitted up for water analysis and for the polariscopic determination of sugar. The lecture room will accommodate one hundred and fifty students. In connection with it is a preparation room, which is supplied with the necessary apparatus and specimens for illustrating the lectures.

FOR UNDERGRADUATES ONLY

102. APPLICATION OF CHEMISTRY TO AGRICULTURE. Four credit hours. Second semester. Short courses in Agriculture and Horticulture. Professor VIVIAN.

Lectures and recitations embrace the following topics: Ingredients of plants, organic and inorganic, essential and non-essential; sources of plant food, air and soil; nature of soil, mechanical portion, nutritive portion, assimilable and reserve plant food; soil exhaustion and amelioration; barnyard manure, its sources, composition, and preservation; commercial fertilizers, their rational use; methods of determining the needs of soils.

103-104. GENERAL AGRICULTURAL CHEMISTRY. Five credit hours. The year. Four-year courses in Agriculture, Horticulture, and Forestry. Prerequisite, Chemistry 106 or 110. Professor VIVIAN, Assistant Professor BEAR, and assistants.

Three lectures and two laboratory periods weekly. Lectures on chemistry as applied to agriculture, including the following topics: Food requirements of plants, sources of plant food, soil exhaustion and amelioration, barnyard manures and commercial fertilizers, com-

position of feeding stuffs and dairy products. Laboratory work consists of a brief introduction to quantitative analysis, gravimetric and volumetric, followed by the analysis of fertilizers, feeding stuffs, and dairy products.

123-124. DOMESTIC SCIENCE CHEMISTRY. Five credit hours. Course in Domestic Science. The year. Prerequisite, Chemistry 106. Associate Professor LYMAN and Miss FREEMAN.

Lectures on household chemistry. Laboratory work consists of a brief introduction to quantitative analysis, followed by the analysis of foods and other materials of household interest.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

105-106. ADVANCED AGRICULTURAL ANALYSIS. Five credit hours. The year. Prerequisite, 103-104. Professors WEBER and VIVIAN and Assistant Professor BEAR.

The work of this course consists of a detailed study of the official methods of determining nitrogen, potash, phosphoric acid; the complete analysis of grains and feeding stuffs, milk, butter, and cheese. Intended for students desiring to specialize in agricultural chemistry.

107-108. DAIRY CHEMISTRY. Three to five credit hours. The year. Prerequisite, 103-104. Time to be arranged. Professors VIVIAN and WEBER.

Lectures on the composition of milk and its products; fermentation, digestion, and decomposition of milk. Laboratory practice on the complete analysis of milk, butter, and cheese; determination of the chemical and physical constants of butter fat; determination of the different proteids of milk and a study of their cleavage products; effect of treatment of dairy products on their chemical composition as shown by analysis, etc. Intended for students specializing in dairying and should be accompanied or preceded by a course in dairying.

109-110. CHEMISTRY OF SOILS. Three to five credit hours. The year. For students specializing in agronomy. Prerequisite, Course 103-104. Time to be arranged. Professors WEBER and VIVIAN.

Lectures and laboratory work on the chemical composition of the soil, using the official method of analysis of soils, and the various methods suggested by the U. S. Department of Agriculture; testing needs of soils for application of commercial fertilizers.

111-112. CHEMISTRY OF ANIMAL NUTRITION. Three to five credit hours. The year. Prerequisites, 103-104 or equivalent. Time to be arranged. Professor VIVIAN.

For students specializing in animal husbandry.

121-122. **FOOD INSPECTION AND ANALYSIS.** Three to five credit hours. The year. Prerequisite, 103-104 or an equivalent preparation in quantitative analysis. Professor WEBER, Associate Professor LYMAN.

Lectures on composition of foods and food adulteration. Laboratory practice embraces the analysis of foods, tea, coffee, syrups, spices, condiments, flavoring extracts, baking powder; sanitary analysis of water; analysis of fats and oils, etc., and the examination of the same for adulteration. This course is designed to prepare for the analytical work connected with the state control of the sale of food stuffs, etc.

125-126. **ADVANCED HOUSEHOLD CHEMISTRY.** Three to five credit hours. The year. Prerequisite, 123-124. Time to be arranged. Professor WEBER and Associate Professor LYMAN.

A study of the composition and analysis of foods; the chemistry of cookery and changes during cooking, as shown by analysis; the examination of cleaning materials, baking powders, the sanitary analysis of water, etc.

FOR GRADUATE STUDENTS ONLY

131-132. **RESEARCH WORK.** Five to ten credit hours. The year. Time to be arranged. Professors WEBER and VIVIAN, and Associate Professor LYMAN.

(Courses 105 to 112, 121-122, and 125 to 126 may be taken as graduate work if not previously elected, or continued as special lines of research during a graduate course.)

AGRONOMY

(Townshend Hall)

PROFESSOR MC CALL, ASSISTANT PROFESSOR RAMSOWER, ASSISTANT PROFESSOR WAID, MR. LIVINGSTON, MR. DARST, MR. BOWER, AND MR. GRANT

For the work in Agricultural Engineering, the department has a laboratory equipped with the latest types of farm machines, including plows, cultivators, corn planters, grain drills, binders, mowers, a half dozen gasoline engines showing the different systems of ignition, cooling devices, etc., a twenty-horsepower gasoline traction engine, a farmer's auto-delivery wagon, and a steam traction engine. Facilities are provided for the handling of

cement and concrete in making fence posts, water troughs, etc. The department also has several drainage levels, an architect's level, a surveyor's transit, for use in laying out drainage systems, surveying fields, etc.

The soils laboratory is provided with apparatus for study of the physical properties of soils, including specific gravity, the retention of moisture, the effect of mulches on evaporation, the rate of percolation of water through soils and the capillary rise of moisture in soils. The laboratory is also provided with a complete centrifugal outfit for the mechanical analysis of soils, and electrical instruments for determining temperature and soluble salt content.

In the study of crops, use is made of a large collection of seeds, of dried specimens of grasses, grains, and other crops, and the growing crops on the farm. For the corn judging work, samples are secured of all the chief varieties grown in different sections of the corn belt, and opportunity is offered in the advanced courses to assist in judging at local corn shows. The market grades of grain and hay are studied by commercial samples secured from the chief markets of these crops. The department is supplied with Brown-Duval testers and ovens for the study of the moisture content of field crops in different stages of curing and under different processes of storage.

The variety test plots include all the principal Ohio varieties of corn, wheat, oats, barley, flax, sorghum, millet, soy beans, and cow peas, and the different species of grasses and legumes used for pastures and meadows, all grown side by side, so that a comparative study may be made as to the value of each. Breeding plots of corn, wheat, alfalfa, clover, and timothy are maintained to give opportunity for the study of variation, correlation, selection, and other principles of plant breeding as well as the practical methods of crop improvement.

101. FARM EQUIPMENT. Four credit hours. First semester. Prerequisite, Engineering Drawing 125. Assistant Professor RAMSOWER.

Lectures and recitations on the laying out and equipment of the farm, the planning of the farm buildings, and a detailed study of farm power, water supply, and farm machinery. Practicum in the laying out of farms, the planning of farm buildings, comparison and testing of farm machines, handling concrete, rope splicing, and in the working out of problems in farm mechanics.

102. AGRICULTURAL ENGINEERING. Three credit hours. Second semester. Prerequisite, Agronomy 101. Assistant Professor RAMSOWER.

Lectures and recitations, covering (a) leveling and surveying instruments, their construction and use; (b) tile drainage, the comparative cost of different systems; size, depth and distance apart of tile; (c) roads; history of road building, kinds of roads, their construction and cost. Field work in differential leveling, laying out drainage systems, constructing road profile, and obtaining areas by chain and transit.

103. FARM EQUIPMENT. Four credit hours. First semester. Two-year courses in Agriculture and Horticulture. Assistant Professor RAMSOWER.

Lectures and practice covering the laying out and the equipment of the farm, the planning of buildings, and a general study of farm power, machinery, water supply, roads, and drainage.

104. ELEMENTARY SOILS. Four credit hours. Second semester. Prerequisite, Geology, 165 or 153. Four-year courses in Agriculture, Horticulture, and Forestry. Professor McCALL and Mr. BOWER.

Lecture and recitations on the origin, formation, and kinds of soil, their chemical and physical composition, and improvement by cultivation, fertilization, drainage, and irrigation. Laboratory studies of the physical properties of soils, and the factors which control soil fertility.

105. ELEMENTARY SOILS. Four credit hours. First semester. Two-year courses in Agriculture and Horticulture. Professor McCALL and Mr. BOWER.

Lectures and recitations on the formation and physical properties of our agricultural soils, with special reference to methods of management and improvement. Practicum in the laboratory for the study of the relation of soils to air, heat, moisture, and fertilizers.

106. FIELD CROP PRODUCTION. Four credit hours. Second semester. Prerequisite, Botany 101 or its equivalent. Professor McCALL and Mr. GRANT.

A study of the history, adaptation, distribution, and classification of the cereal crops, and the cultivation, harvesting, and marketing of the same throughout the great agricultural sections of the world, with special attention given to Ohio conditions.

107. **ADVANCED SOILS.** Four credit hours. First semester. Prerequisite, Agronomy 104 or 105. Professor McCALL.

Lectures on (a) the general character and the distribution of the more important soil types of the United States and their adaptability to crops, (b) the factors underlying soil fertility, with special reference to the effect of different methods of cultivation and cropping. The lectures will be supplemented by field trips for the identification and mapping of soil types and by laboratory work, which will include the mechanical analysis of soils and a study of their physical behavior.

108. **CROP PRODUCTION.** Four credit hours. Second semester. Two-year course in Agriculture. Professor McCALL and Mr. GRANT.

A study of the cultivation, harvesting, and utilization of the principal cereal and forage crops of the United States, with special reference to Ohio conditions.

109. **SEED AND MARKET GRAIN.** Two credit hours. First semester. Prerequisite, Agronomy 106. Professor McCALL.

Seed selection; corn and small grain judging, and the market grading of grains.

110. **AGRICULTURAL EXPERIMENTATION.** Three credit hours. Second semester. Lecture arranged. Professor McCALL.

Lectures upon history and development of experiment stations, methods, and character of station work, and the interpretation of experimental results. Seminars devoted to critical study of experiment station literature, and to the methods of experimentation.

111. **GRASSES AND FORAGE CROPS.** Three credit hours. First semester. Prerequisite, Botany 101 or its equivalent. Professor McCALL and Mr. GRANT.

The study of the history, distribution, adaptation, characteristics, cultivation, harvesting, and marketing of the principal forage crops, including the grasses and legumes used for pastures and meadows, annual forage crops, soiling, and silo crops. Laboratory work in the study of methods and preparing the seed bed, root systems of forage plants, root nodules and inoculation of legumes, moisture content of forage crops, comparison of silage methods, comparative study of annual forage crops, and seed testing for purity and germination.

113. FIELD CROP IMPROVEMENT. Three credit hours. First semester. Prerequisite, Agronomy 106. Professor MCCALL.

A study of the principles involved and the methods used in the improvement of field crops.

114. ADVANCED FARM MACHINERY. Two credit hours. Second semester. Prerequisite, Agronomy 106.

A detailed study of the Construction of Farm Machinery. Expert work in assembling and testing grain binders, corn harvesters, mowers, etc. Efficiency tests of gasoline and steam engines. Assistant Professor RAMSOWER.

115-116. ADVANCED CROP PRODUCTION. Five to ten credit hours. The year.

Research work in plant breeding, the study of plant breeding experiments at the University and at the State Experiment Station, and the investigation of crop improvement work in other states and countries.

Research and monograph work in one or more of the cereal or forage crops.

117-118. ADVANCED CROP IMPROVEMENT. Five to ten credit hours. The year.

119-120. RESEARCH WORK IN SOILS. Five to ten credit hours. The year.

The preparation of monographs and special laboratory or field work on topics connected with the subject of soils, including (a) methods of surveying and mapping, (b) the relation of soil types to crop production, and (c) the influence of certain physical properties upon crop production.

121. FARM ARCHITECTURE. Two credit hours. First semester. Prerequisite Drawing 125. Lectures covering the properties of materials used in the construction of farm buildings: timber, building tile, brick, cement blocks, etc. Relative cost of buildings from different materials; the decay of timber, its cause and prevention; composition of paints and varnishes, how to mix and apply; principles and methods of ventilation. Drawing room work in designing farm structures and estimating cost of same. Assistant Professor RAMSOWER.

GRADUATE WORK

Special work in soils, or crops, will be arranged for students desiring to take a graduate course in agronomy. Graduate students taking this work will be given an opportunity to prepare for work in the United States Department of Agriculture and for college and experiment station positions.

AMERICAN HISTORY

(Office, Room 207, University Hall)

PROFESSOR KNIGHT, ASSOCIATE PROFESSOR HOCKETT

101-102. POLITICAL HISTORY OF THE UNITED STATES. Three credit hours. The year. Professor KNIGHT, Associate Professor HOCKETT.

An outline course covering the period 1600-1900, considering political, economic, and personal aspects of American history from the origins to the present day. The Epochs series, by Thwaites, Hart, and Wilson, and MacDonald's Documentary Source Book of American History, will be used as text-books, supplemented by outside reading in the works of Fiske, the American Statesman series, and the American Nation series. Recitations and reports.

ANATOMY AND PHYSIOLOGY

(Biological Hall, Rooms 12 and 20)

PROFESSOR BLEILE, ASSOCIATE PROFESSOR SEYMOUR, ASSISTANT PROFESSOR DURRANT, MR. FEIEL.

The facilities provided for the study of anatomy, histology, and physiology are good. The laboratory is supplied with skeletons, manikin, and many models of the organs of the body. The apparatus for work in physiology is of good construction and adequate for the performance of fundamental physiological experiments.

For work in histology the equipment includes sixty individual tables for student work, each one being supplied with a good microscope and the various accessories. The equipment of the laboratories makes it possible to offer work along certain lines to advanced students.

101-102. HUMAN ANATOMY AND PHYSIOLOGY. Three credit hours. The year. This course must be preceded by a course in chemistry. Professor BLEILE, Associate Professor SEYMOUR, Assistant Professor DURRANT,

103. GENERAL PHYSIOLOGY. Three credit hours. First semester. Short course in Agriculture. Assistant Professor DURRANT.

104. CHEMICAL PHYSIOLOGY. Three credit hours. Second semester. Professor BLEILE.

ANIMAL HUSBANDRY

(Live Stock Pavilion)

PROFESSOR PLUMB, PROFESSOR MARSHALL, ASSIST. PROFESSOR VAUGHAN

The University herd contains a large number of valuable, high-class animals. These include excellent specimens for class room work of pure bred Shorthorn, Aberdeen Angus, Jersey, Guernsey, Holstein-Freisian, Kerry, and Red Polled cattle, and a variety of grade and pure bred beef steers. Good specimens of Merino, South-down, Shropshire, and Cotswold sheep, and Berkshire, Poland China, Duroc-Jersey, and Large Yorkshire swine are also kept. For years the department has shown specimens of the University stock at the International Live Stock Exposition, where numerous important prizes have been won. These show animals are extensively used in the judging work of the students. The University owns some choice pure bred Percheron, Clydesdale, and Hackney mares, and good specimens of work horses. In addition to this, at convenient distances are famous studs of imported Percheron, French Coach, German Coach, and Belgian horses. Students are conducted to Columbus stables containing large numbers of horses, and to stock farms about Columbus and in neighboring counties, where methods of feeding and handling may be studied and animals inspected. Each year a class of students attends the International Live Stock Exposition at Chicago in charge of instructors, spending a few days among the stock exhibits, the Union stock yards, and packing houses. Class room facilities in animal husbandry are of a very high order. The judging pavilion for live stock is a beautiful brick structure with a large room 112 feet long, with tan-bark floor, on which stock may be shown

to the very best advantage. This building, with the new cattle and horse barns, all constructed in 1907 at a cost of \$80,000, gives the University the finest facilities for teaching Animal Husbandry. As additional facilities for instruction, the University has a superior collection of herd, flock, and stud books of the various American and European breeding associations, these being used in laboratory work in the Principles of Breeding and the study of breeds. There is also a large collection of lantern slides of breeds and types of animals, various instruments for measuring and studying stock, specimens of feeding stuffs, wools, and other animal products.

FOUR-YEAR COURSE

101. TYPES AND CLASSES OF CATTLE AND SHEEP. Four credit hours. First semester. Assistant Professor VAUGHAN.

A discussion of the various types of cattle and sheep and the market classes. Judging work will include specimens of the various types and classes judged by score card, comparison, etc.

102. TYPES AND CLASSES OF HORSES AND SWINE. Four credit hours. Second semester. Professor MARSHALL, Assistant Professor VAUGHAN.

A discussion of the various types, classes and grades of horses and swine. Judging work will include score card and comparative studying of individuals and groups.

103. BREEDS OF HORSES AND SHEEP. Four credit hours. First semester. Professor PLUMB, Professor MARSHALL.

Lectures, text-books, and recitations upon the history, development, characteristics, and adaptations of types and breeds of horses and sheep. Laboratory work includes judging types and breeds of horses and sheep one afternoon a week and occasional inspection trips to herds in the state.

104. BREEDS OF CATTLE AND SWINE. Four credit hours. Second semester. Professor PLUMB, Professor MARSHALL.

Covers the subjects of cattle and swine on the same basis as Course 103.

105. FEEDING ANIMALS. Three credit hours. First semester. Professor VIVIAN, Professor PLUMB.

A consideration of the laws of nutrition, the character and composition of feed stuffs and methods of feeding different kinds of farm animals under varying conditions. Work to a reasonable extent is required of students in calculating rations and in studying rations in practical use in the community and suggesting improvements if desirable. The economy of the subject is carefully considered. Professor Vivian has charge of the class the first part of the semester on the subject of the chemistry of foods and nutrition, Professor Plumb taking the balance of the semester in a discussion of practical feeding problems.

106. PRINCIPLES OF BREEDING. Four credit hours. Second semester. Professor MARSHALL.

Lectures, text-books, and recitations upon the subjects of heredity from various points of view in its application to breeding farm animals. Library research is required, and for laboratory work one afternoon a week is devoted to studying pedigree construction, and working out problems in heredity from herd books. Students taking this course should have had either course 103 or 104, and preferably both. Also the course in Zoology in the Freshman year.

107. ANIMAL CONFORMATION AND STOCK JUDGING. Four credit hours. First semester. Professor MARSHALL and Assistant Professor VAUGHAN.

This is an advanced class for students who have already had the work of the Junior year in Courses 103 and 104. The purpose is to give a more detailed consideration to type and breed conformation, with an emphasis on practice in judging groups and classes and rendering required reasons therefore. Only students who have generally covered certain necessary judging work are expected to take this course.

108. HYGIENE AND MANAGEMENT. Four credit hours. Second semester. Professor MARSHALL. This course should be preceded by 105 and 106.

A series of lectures on the sanitation of the stable, on conditions of health surrounding stock in general. The management of breeding studs, herds, and flocks is included. The economical production of horses, of beef, milk, mutton, wool, and pork are studied in detail.

109. HORSE TRAINING. THE HARNESS AND VEHICLE. Two credit hours. First semester. Professor MARSHALL.

A study of equine intelligence, and the training and development of the horse for the purposes of man. This also includes the study of methods of riding and driving, etc. The second half of the first semester is devoted to a study of the harness and vehicle, their history and development, construction and adaptability to various uses in connection with the horse.

110. MEATS AND MEAT PRODUCTS. One credit hour. Second semester. Professor PLUMB.

Methods of slaughter of farm animals, the preparation of the carcass, and the various cuts and products derived therefrom.

112. LIVE STOCK MARKETING AND COMMERCE. Four credit hours. Second semester. Professor PLUMB.

A discussion of the purpose and work of live stock markets, methods of sale and shipment, the practices of the live stock markets and yards, the market classification and grading, the export and import trade, etc. Considerable library work is required in this subject, studying comparative market reports and market development. Visits are also made to stock yards, transportation agencies, packing houses, etc.

114. BIOGRAPHICAL STUDIES OF MASTER BREEDERS. One credit hour. Second semester. Time to be arranged. Professor PLUMB.

A series of lectures discussing the lives and methods of famous master breeders of live stock.

116. DAIRY CATTLE. Four credit hours. Second semester. Professor PLUMB.

The different breeds of dairy cattle will be studied, a limited amount of score card work conducted, and considerable judging by comparison in group method. Dairy herds in the vicinity of Columbus will also be visited as conditions will permit.

117-118. POULTRY HUSBANDRY. Three credit hours. The year.

This course will be offered in 1911-1912 providing the Legislature makes the necessary appropriation for the additional equipment and instruction required in the work.

126. WOOLS AND OTHER ANIMAL FIBERS. Three credit hours. Second semester. Time to be arranged. Professor PLUMB.

Lectures and seminary work on the character and composition of wools and other animal fibers, the market classification, shearing, preparation for market, the uses of fibers in manufacturing, etc. Laboratory work with microscope in studying fibers. Practice in shearing is required.

TWO-YEAR COURSE

123. DAIRY CATTLE. Four credit hours. First semester. Laboratory to be arranged. Professor PLUMB.

Text-book and discussion of the history, characteristics, economic value, etc., of breeds of dairy cattle. Practical work in judging one afternoon a week, various methods being used. Herds of cattle in the vicinity will be visited.

128. FEEDING AND BREEDING OF ANIMALS. Three credit hours. Second semester. Assistant Professor VAUGHAN.

A study of the principles of nutrition, character and composition of feed stuffs, and methods of feeding different kinds of farm animals under various conditions occupies the first half of the semester. The second half is given to the principles of breeding, text-book, lectures, and recitations being required. Pedigree study and problems in heredity occupy the laboratory period.

129-130. TYPES AND BREEDS OF LIVE STOCK. Four credit hours. The year. Assistant Professor VAUGHAN.

Text-book and discussion on the history, characteristics, adaptability, economic value, etc., of types and breeds of live stock. Practical work in judging one afternoon a week, both score card and comparative group work being used.

132. TYPES AND BREEDS OF LIVE STOCK. Three credit hours. Third year. Second semester. Elective. Professor MARSHALL.

For veterinary college students only. Lectures and recitations upon types and breeds of live stock, more especially horses and cattle as coming within the field of the veterinary practitioner.

GRADUATE WORK IN ANIMAL HUSBANDRY will be provided in this department to suit the needs of the student, under the general rules of the University for this work.

Courses are offered as lines of special study under departmental direction. Special investigational facilities are at hand, in the use of the University stables, the laboratory in agricultural chemistry, the extensive library of works on animal husbandry, the large stables in and about Columbus, etc. No animal husbandry department in America has at its disposal a more comprehensive supply of material for the student of the horse.

ARCHITECTURE

(Office, Brown Hall)

PROFESSOR BRADFORD, ASSOCIATE PROFESSOR CHUBB, MR. HASKETT

101-102. HISTORY OF ARCHITECTURE. Three credit hours. The year. Lectures illustrated by lantern slides. Professor BRADFORD.

ART

(Office, Hayes Hall)

PROFESSOR LAVER, MISS FINNEY

101-102. DESIGN AND COMPOSITION. Two credit hours. The year. Miss FINNEY.

This course is designed to develop appreciation of harmony of line, space, and color. It brings into play the creative imagination and establishes a basis for critical judgment along all art lines. Nature motives used. Study of color, theory, and harmony. Medium: Pencil, ink, charcoal, and water color.

105-106. DESIGN AND COMPOSITION. Two credit hours. The year. Prerequisite, Course 102. Miss FINNEY.

Continuation of Art 102 with advanced problems in color and line as applied to decoration.

BACTERIOLOGY

(Office, Veterinary Laboratory Building)

PROFESSOR MORREY, PROFESSOR McCAMPBELL, MR. STARIN

These courses in Bacteriology are open to advanced undergraduate and graduate students only. The instructor in charge must be consulted before electing.

104. AGRICULTURAL BACTERIOLOGY. Three credit hours. Second semester. For two-year courses in Agriculture and Horticulture. Professor McCAMPBELL, Mr. STARIN.

107. GENERAL BACTERIOLOGY. Three to five credit hours. First semester. Professor MORREY, Professor McCAMPBELL, Mr. STARIN.

108. PATHOGENIC BACTERIOLOGY. Three to five credit hours. Second semester. Prerequisite, Course 107. Professor MORREY, Professor McCAMPBELL, Mr. STARIN.

110. DAIRY BACTERIOLOGY. Three to five credit hours. Second semester. Prerequisite, Course 107. Professor MORREY.

112. SOIL BACTERIOLOGY. Three to five credit hours. Second semester. Prerequisite, Course 107. Professor MORREY.

121-122. ADVANCED DAIRY BACTERIOLOGY. Three to five credit hours. The year. Prerequisites, Course 107 and 110, or equivalents. Professor MORREY.

123-124. ADVANCED SOIL BACTERIOLOGY. Three to five credit hours. The year. Prerequisites, Course 107 and 112, or equivalents. Professor MORREY.

BOTANY

(Office, Botanical Hall)

ASSOCIATE PROFESSOR SCHAFFNER, ASSISTANT PROFESSOR GRIGGS,
ASSISTANT PROFESSOR DACHNOWSKI, MISS DETMERS

The department offers good facilities for instruction and investigation. The museum contains a large amount of material, illustrative of the various groups of plants, the collection of Ohio woods being complete. There is a good general herbarium and the State herbarium consists of between twenty and thirty thousand sheets of Ohio plants. The laboratories are well equipped with dissecting and compound microscopes, also the usual appliances for doing both elementary and advanced morphological and physiological work. The greenhouse attached to the Botanical building is an important adjunct to the department, furnishing much fresh material for study. It is also used as a laboratory for certain phases of the work in plant physiology.

101-102. GENERAL BOTANY. Four credit hours. The year. Text-books, Curtis' *Nature and Development of Plants*, Schaffner's *Laboratory Outlines for General Botany* (2d edition). Associate Professor SCHAFFNER, Assistant Professor GRIGGS.

This course is a general survey of the plant kingdom by the method of types. It is intended to give a general view of the morphology, evolution and classification of plants from the lowest to the highest.

110. DENDROLOGY. Two credit hours. Second semester. Text-book, Schaffner's *Trees of Ohio and Surrounding Territory*. Associate Professor SCHAFFNER.

A study of trees and shrubs, with practice in the identification of woody plants, both in summer and winter condition. Students are required to prepare a dendrological herbarium.

112. ELEMENTARY BOTANY. Four credit hours. Second semester. Text-books, Coulter's *A Text-book of Botany*, and Kellerman's *Spring-Flora* (New edition). Miss DETMERS.

This is a general elementary course, consisting mostly of organography, plant physiology and a study of the native flora, but some instruction is also given in ecology and classification. The students are required to do work in the field both in observation and collecting.

This course cannot be used for University credit.

116. PLANT PATHOLOGY. Three credit hours. Second semester. Prerequisite, Botany 101-102, or equivalent. Text-book, Duggar's Fungous Diseases of Plants. Assistant Professor GRIGGS.

The diseases of plants due to physical causes and animals are briefly considered, but the main part of the course is devoted to a study of the parasitic fungi most destructive to cultivated plants. Each student takes some economic subject or group of parasites for special study and is required to prepare a complete report on the same.

117-118. FOREST BOTANY. Four credit hours. The year. Prerequisite, Botany 101-102 or equivalent. Assistant Professor DACHNOWSKI.

In this course the emphasis is laid on the ecological study of forests. It includes work on the native and introduced trees and the preparation of a dendrological herbarium, together with a floristic study of some special group. This is supplemented by a study of the development of woods, characters of coniferous, hard, and soft woods and changes due to attacks of fungi. The students are required to prepare a series of gross and microscopic sections. A study is also made of the genetic development of local forests, and of the fungi injurious to trees and wood.

125-126. PLANT PHYSIOLOGY. Four credit hours. The year. Laboratory and field work. Prerequisite, Botany 101-102, or equivalent. Assistant Professor DACHNOWSKI.

The course is an experimental study of the soil, air, and biotic relations of plants. It aims to give training and instruction in such phases of nutrition, growth, movement, and the tropisms of plants as have a practical bearing on agriculture, forestry, and general biology.

CHEMISTRY

(Office, Chemistry Hall)

PROFESSOR MC PHERSON, ASSOCIATE PROFESSORS EVANS AND WITHROW,
DEPARTMENT ASSISTANTS

The laboratories of the department accommodate over one thousand students. Each laboratory is equipped with all necessary conveniences—water, gas, electric lights, distilled water piped from a large still in the attic, steam ovens, automatic air blasts, suction pumps, etc. The department is liberally supplied with the best apparatus and materials for both lecture-room and laboratory work. Each student has his own desk with drawers and locker.

All supplies are procured from the chemical store room, which has always on hand a complete stock of all necessary materials.

101. ELEMENTARY CHEMISTRY. Four credit hours. First semester. One lecture, one quiz, six hours laboratory work weekly. Associate Professor EVANS, Mr. STRATTON.

A general introductory course on the chemistry of the non-metals. It is distinctly elementary in character and is arranged for students in short courses only. No credit is allowed for it in the regular four-year courses. Students taking this course should follow with Course 102, second semester.

102. ELEMENTARY CHEMISTRY AND QUALITATIVE ANALYSIS. Four credit hours. Second semester. One lecture, one quiz, six hours laboratory work weekly. Prerequisite, 101. Associate Professor EVANS, Mr. WITZEMANN.

A general introductory course on the chemistry of the metals. The laboratory work deals with the elementary principles of qualitative analysis. The course is arranged for students in short courses only. No credit is allowed for it in the regular four-year courses.

105. ELEMENTARY CHEMISTRY. Four credit hours. First semester. Associate Professor EVANS, Miss MORGAN, Mr. STRATTON, Mr. HALL.

A general course on the chemistry of the non-metals, arranged for students who have not presented chemistry as an entrance requirement. Students taking this course will follow with Course 106, second semester.

106. ELEMENTARY CHEMISTRY AND QUALITATIVE ANALYSIS. Four credit hours. Second semester. Prerequisite, Course 105. Associate Professor EVANS, Mr. KELLOGG, Mr. STRATTON, Miss MORGAN.

A general course on the chemistry of the metals. The laboratory work accompanying is a general introductory course in qualitative analysis.

109. GENERAL CHEMISTRY. Four credit hours. First semester. One lecture, one quiz, six hours laboratory work weekly. Associate Professor EVANS, Mr. KELLOGG, and Mr. WITZEMANN.

A general course on the chemistry of the non-metals. It is more advanced than Course 105, and is arranged for students who have had an acceptable course in elementary chemistry in a secondary school. Students taking this course will follow with Course 110, second semester.

110. GENERAL CHEMISTRY AND QUALITATIVE ANALYSIS. Four credit hours. Second semester. Prerequisite, Course 109. Time same as Course 109. Associate Professor EVANS, Mr. KELLOGG, Mr. STRATTON, Miss MORGAN.

A general course on the chemistry of the metals. It is more advanced than Course 106. The laboratory work is a general course in qualitative analysis.

127. ORGANIC CHEMISTRY. Five credit hours. First semester. Two lectures, one quiz, six hours laboratory work weekly. Prerequisite, an acceptable course in general chemistry. Professor MCPHERSON, Miss MACLEAN.

This is a general introductory course in organic chemistry.

151-152. ORGANIC CHEMISTRY. Two credit hours. The year. Two lectures weekly. Prerequisite, an acceptable course in general chemistry; also in quantitative analysis, except by special permission of the instructor. Professor MCPHERSON.

This is a general course in organic chemistry.

153-154. ORGANIC CHEMISTRY. Two or three credit hours. The year. Six or nine hours laboratory work weekly. Laboratory open afternoons. This course must be accompanied or preceded by Course 151-152. Professor MCPHERSON, Mr. BOORD.

A general course in the preparation of typical organic compounds.

CIVIL ENGINEERING

(Office, Brown Hall, Room 33)

MR. HINKLE, MR. STERTZBACH

121. SURVEYING AND TOPOGRAPHIC DRAWING. Six credit hours. First semester. Prerequisite, Mathematics 114 or 132, and Engineering Drawing 101.

The work will be divided into lectures, recitations, field work, computing, and drawing in such manner as the schedule and weather will permit.

DAIRYING

(Office, Townshend Hall)

PROFESSOR ERF, MR. CUNNINGHAM, MR. CLEVINGER

The department of dairying occupies the greater part of the first floor of Townshend Hall. It offers good facilities for instruction and investigation. The laboratories

are equipped for the following lines of work : Milk testing, care and bottling of sanitary milk, buttermaking, cheese-making, ice-cream making, milk condensing, dairy mechanics.

Individual milk testing apparatus is furnished to each student. In the laboratory are found Babcock centrifuges, balances, etc., to make a complete test of the milk. The department operates a commercial, guaranteed milk and cream distributing plant. It has its own wagons for distributing the products and is equipped with modern milk dealers' implements, such as bottlers, washing outfits, and steam pressure sterilizers. In connection with this plant there is also a refrigerator provided for the bottled milk. The milk is received from two sources, part from an inspected farm and the balance from the University herd. The milk is bottled and sold, the students doing the work.

The farm cream separator laboratory is equipped with various styles of cream separators and coolers. The creamery laboratory is equipped with different types of cream ripeners, pasteurizers, starter cans, churns and printers. Butter is made throughout the year on a commercial basis from milk and cream received from a number of dairies aggregating over 200 cows and the plant is operated on a regular commercial scale with students doing most of the work. The cheesemaking laboratory is equipped with a cold curing room and a cellar for making brick and Swiss cheese. Cream cheeses are made each week as a part of the commercial products of the laboratory and instruction is given along this line during the college year. The ice-cream making laboratory is equipped with freezers, brine and ice, and the proper mixing contrivances. A laboratory is provided for milk condensing where a condensing plant is operated for instructional purposes.

Dairy mechanics work is provided for in special laboratories which are equipped with boilers, engines, a refrigerating plant, pumps, pipe fitting apparatus, and soldering outfit. The laboratory work is of the most practical kind and is supplemented by lectures, recitations and quizzes in the class room.

Lectures and practical demonstration are given in dairy farm work, especial attention being paid to the Advanced Registry and Cow Testing Association work. The department has charge of this work in Ohio.

The work of the department is designed for three classes of students, the regular students in the two and four-year courses and the students of the special dairy courses. The latter is arranged for the practical dairyman who cannot devote a longer time to the scientific study of dairy methods.

FOUR-YEAR COURSE

101. PRINCIPLES OF DAIRYING. First semester, four credit hours. Professor ERF, Mr. CUNNINGHAM.

Lectures are given on secretion of milk and the testing of milk and cream for butter fat; feeding and caring for dairy cows as related to the economical production of milk; formation of profitable herds; testing individual cows and herds for butter fat production, and also how to enter and test cows for the Advanced Registries. In the laboratory, practical work will be given in testing milk and cream for butter fat, testing dairy herds for butter fat production, the practice of operating farm cream separators, the care of milk and cream, buttermaking, cheesemaking, also plumbing and soldering as needed in dairy operations.

102. FARM DAIRYING. Second semester, four credit hours. Professor ERF, Mr. CUNNINGHAM.

Lectures will be given on the planning and equipping of dairy barns, milk houses, dairy plants, farm milk houses, refrigerators and arranging of yards. Lectures will also be given on the handling and manufacturing of farm dairy products for the market, dairy farm management, and a study of the comparison of the different systems

under various conditions. The laboratory work will consist of designing dairy barns, dairy plants, dairy houses, refrigerators, etc., including the operation of boilers and engines and the setting up and operating of dairy machinery.

103 or 104. CITY MILK SUPPLY. First or second semester. Two credit hours. Mr. CUNNINGHAM.

This includes lectures and practical work on the handling and distributing of milk for city trade, including milking, cooling, clarifying, pasteurizing, standardizing and bottling of milk and cream; the testing of milk for butter fat and total solids; methods of determining the bacterial count and leucocytes in milk, in order to comply with the rules laid down by the various city ordinances.

105 or 106. BUTTERMILKING. Five credit hours. First semester and repeated in the second semester. Mr. CLEVENGER.

In the lecture room the principles of buttermaking, including cream separation, churning, packing and marketing of butter and the development of pure cultures will be thoroughly discussed. In the laboratory the work discussed in the lecture room will be put into practice.

107 or 108. CHEESEMAKING. Three credit hours. First semester and repeated in the second semester. Mr. CADWALLADER.

Lectures on cheesemaking and laboratory work will be given in the manufacture of cottage, cream, Cheddar and brick cheeses.

110. ICE-CREAM MAKING AND MILK CONDENSING. Five credit hours. Second semester. Time to be arranged. Mr. CUNNINGHAM.

Lectures will be given on the theory of milk condensation and ice-cream making. Practical work with the vacuum pans and sterilizers will be given in the condensing laboratory and practical work in ice-cream making, in the ice-cream laboratory.

111. DAIRY MECHANICS. Three credit hours. First semester. Mr. CLEVENGER.

This work consists of one hour lecture and three hours laboratory work. It will treat of the construction and operation of steam boilers, steam and gas engines, steam pumps, compressors, refrigerating machines, belting, hanging of shafting, and pulleys, pipe fitting and soldering, and the operating of steam and gas engines. It is intended to train the student to do the mechanical work in milk plants, cheese factories, creameries, etc.

113-114. ADVANCED DAIRYING. Three credit hours. The year. Professor ERF.

Seminar on assigned readings in experiment station and other dairy literature will be arranged in this course. Investigation work of special character along any particular line of dairying will be arranged for. Laboratory work will be provided in connection with this work.

117-118. ADVANCED DAIRYING. Five to ten credit hours. Second semester. Professor ERF.

This course is intended for graduate students.

Special work will be arranged for students desiring to take up any particular phase of dairying. Any apparatus on hand will be furnished and room will be arranged for students desiring to take up any line, such as farm dairying, the feeding and breeding of dairy cows in relation to milk production, the study of milk in its various phases, buttermaking, cheesemaking, milk condensing, ice-cream making, etc.

TWO-YEAR COURSE

109. ELEMENTARY DAIRYING. Four hours. First semester. The work offered in this course is similar, in the main, to Course 101. Professor ERF, Mr. CUNNINGHAM.

DOMESTIC SCIENCE.

(Office, Hayes Hall)

PROFESSOR WARDALL, ASSOCIATE PROFESSOR WHITE, ASSOCIATE PROFESSOR FLINT, MISS BLOHM

I. DOMESTIC SCIENCE

101-102. FOODS. Four credit hours. The year. Prerequisite, Chemistry 106 or 110. Associate Professor WHITE.

A study of nutritive principles; their occurrence in ordinary food stuffs, their cost from various sources, and the principles involved in their preparation. Lectures and recitations are combined with laboratory work.

103. DIETETICS. First semester. Four credit hours. Prerequisite, Domestic Science 101-102, Physiology 101-102, and Agricultural Chemistry 123-124. Professor WARDALL.

A study of the principles of diet, food in its relation to health, standard dietaries, construction of dietaries and diet in disease. Laboratory work includes translation of standard dietaries into food materials, and some exercise in making dietary studies. Practice is also given in preparation of food for the sick.

104. THE HOUSE. Three credit hours. Second semester. Associate Professor WHITE.

Situation of the house with regard to general surroundings. The householder's interest in the construction of the house. Sanitary conditions in and around the house. Ventilation, water supply, heating, and plumbing. The purpose of the house. Prerequisite, Bacteriology 107.

105-106. SEMINAR. Two to five credit hours. The year. Open only to fourth year and graduate students. Professor WARDALL, Associate Professor WHITE.

107. HOUSEHOLD MANAGEMENT. Three credit hours. First semester. Prerequisite, Courses 101-102, Economics 135-136 or 138. Associate Professor WHITE.

The aim of this course is to set forth some of the principles underlying housekeeping, including the organization of the household, division of income, household processes, and care of the household.

108. TEACHERS' COURSE. Three credit hours. Second semester. Open to seniors. Professor WARDALL.

II. DOMESTIC ART

101-102. TEXTILES. Two credit hours. The year. Prerequisite or concurrent, Art 101-102.

This course includes the study of fibres and fabrics from an historic, economic, and social standpoint. In the laboratory the making of articles involves the proper selection of material and the working out of suitable designs. Associate Professor FLINT, Miss BLOHM.

103. DRESS. Three credit hours. First semester. Prerequisite, Domestic Art 101-102; Art 105-106 must be taken with this work.

In this course economics, hygiene, design, and color are considered in their relation to dress. The laboratory work includes the drafting and designing of patterns, the careful selection and combination of materials, and the making of dresses. Associate Professor FLINT, Miss BLOHM.

104. HOUSEHOLD ART. Three credit hours. Second semester. Prerequisite, or Concurrent Art 105-106.

This course includes the study of house furnishings, their color, design, suitability for purpose and cost. The laboratory work consists of visits to shops, the making of plans and estimates for house furnishing, the designing and making of accessories in furnishing and decorating the house. Associate Professor FLINT, Miss BLOHM.

Note.—In all courses students provide their own materials.

105. TEACHERS' COURSE. Three credit hours. First semester.

Prerequisite, Course 101-102, 103, and 104. Associate Professor FLINT.

Subjects of interest to the teachers are discussed. Problems of equipment and cost. Planning and practice in the presentation of lessons. Visits to schools.

106. DRESS. Three credit hours. Second semester. Associate Professor FLINT.

Continuation and amplification of 103. Designed for those intending to specialize in this subject.

DRAWING

(See Engineering Drawing)

ECONOMICS AND SOCIOLOGY

(Office, Room 211, University Hall)

PROFESSOR HAGERTY, PROFESSOR HAMMOND, ASSOCIATE PROFESSOR MC KENZIE, ASSISTANT PROFESSOR LOCKHART, ASSISTANT PROFESSOR GEPHART, ASSISTANT PROFESSOR HUNTINGTON, MISS SHEETS

I. ECONOMICS

135-136. PRINCIPLES OF ECONOMICS. Three credit hours. The year. Assistant Professors LOCKHART and GEPHART, Miss SHEETS.

A careful study of the laws of production, exchange, distribution, and consumption of wealth, combined with an analysis of the industrial actions of men as regards land, labor, capital, money, credit, rent, interest, wages, etc. Text-book, lectures, and individual investigations.

138. PRINCIPLES OF ECONOMICS. Five credit hours. Second semester. Open only to students in Domestic Science and Domestic Art. Miss SHEETS.

141. PUBLIC FINANCE. Two credit hours. First semester. Prerequisite, Economics 135-136. Assistant Professor LOCKHART.

Public expenditures; sources of revenue, with special reference to problems of taxation; public credit; the budget; financial administration.

142. FINANCIAL HISTORY OF THE UNITED STATES. Two credit hours. Second semester. Prerequisite, Economics 135-136. Assistant Professor LOCKHART.

A study of the fiscal and monetary history of the country from colonial times to the present, with special reference to federal taxation, loans, and financial administration, currency legislation, and the development of banking institutions.

*167. RAILWAY ECONOMICS. Three credit hours. First semester. Prerequisite, Economics 135-136. Professor HAMMOND.

The development of means of transportation. Railway growth and consolidation. Railway rate theories and practice. Railway commissions and public control. Government ownership of railroads.

*168. RAILWAY ORGANIZATION AND ADMINISTRATION. Three credit hours. Second semester. Prerequisite, Course 167. Professor HAMMOND.

The organization of modern railway systems and the functions of the various departments. Rate making and the work of the traffic department. The work of the industrial commissioner. Railway finance and statistics. The relation of the railroads to the accounting division of the Interstate Commerce Commission.

II. SOCIOLOGY

101-102. PRINCIPLES OF SOCIOLOGY. Three credit hours. The year. Professor HAGERTY, Associate Professor MCKENZIE.

A study of the fundamental principles of sociology. Text-book, lectures, collateral reading, and individual investigation.

107. THE FAMILY. Three credit hours. First semester. Prerequisite, Sociology 101-102. Miss SHEETS.

A study of matrimonial institutions and family organization in primitive society. The evolution of marriage and the family through the Greek, Roman, and Medieval periods. The modern family, its functions, and its problems.

120. THE HOUSEHOLD. Three credit hours. Second semester. Prerequisite, Sociology 119. Miss SHEETS.

The family as an economic institution. The evolution of household industries and its effect upon the home. Organization of the household with reference to the functions of man and woman. This course will also consider the present organization of the household from the point of view of its efficiency, and the meaning of the changes which it is undergoing.

ENGINEERING DRAWING

(Office, Room 42, Brown Hall)

PROFESSOR FRENCH, ASSISTANT PROFESSOR MEIKLEJOHN, MR. HARPER, MR. SHEETS, MR. TURNBULL, MR. NORRIS.

101. ELEMENTARY MECHANICAL DRAWING. Two credit hours. First semester.

116. PEN DRAWING. Two credit hours. Second semester.

119. CLAY MODELING. Two credit hours. First semester.

*Not given in 1911-1912.

125. MECHANICAL DRAWING. Two credit hours. First semester.

126. Repetition of 125.

127. MECHANICAL DRAWING. One and one-half credit hours. First semester.

Elementary mechanical and architectural drawing.

128. HOUSE PLANNING. One and one-half credit hours. Second semester. Prerequisite, Drawing 127.

127 and 128 are required in Domestic Science, second year.

137. ENGINEERING DRAWING. Two credit hours. First semester. Prerequisite Drawing 101.

A course especially for forestry students. Practice in topographic drawing, tracing and blue-printing, and the design of simple engineering structures, such as culverts, trestles, small wooden bridges and dams.

138. ENGINEERING DRAWING. Two credit hours. Second semester. Continuation of 137.

ENGLISH

(English Building)

PROFESSOR DENNEY, PROFESSOR MCKNIGHT, ASSOCIATE PROFESSOR GRAVES, ASSISTANT PROFESSORS DUNCAN, BLANCHARD, BECK.

101. PARAGRAPH WRITING. Description and Narration. Two credit hours. First semester. (Course 101 will be repeated in the second semester as Course 102 for the benefit of those who fail, the class meeting Saturdays at 9 a. m.) All instructors.

104. PARAGRAPH WRITING. Exposition and Argumentation. Two credit hours. Second semester. Prerequisite, Course 101. Same hours as for Course 101. (Course 104 is also offered in the Summer Session.) All instructors.

107. ADVANCED DESCRIPTION AND NARRATION. Two credit hours. First semester. Prerequisite, Course 101. Associate Professor GRAVES.

108. ADVANCED EXPOSITION AND CRITICISM. Two credit hours. Second semester. Prerequisite, Course 101. Associate Professor GRAVES.

121. PRINCIPLES OF PUBLIC SPEAKING. Two credit hours. First semester. Assistant Professor BLANCHARD.

122. DEBATING. Two credit hours. Second semester. Assistant Professor BLANCHARD.

132. SURVEY OF AMERICAN LITERATURE. Three credit hours. Second semester. No prerequisite course. Professors TAYLOR, McKNIGHT, Associate Professor GRAVES, Assistant Professors DUNCAN and BECK.

133. SURVEY OF ENGLISH LITERATURE. Three credit hours. First semester. No prerequisite course. Professor McKNIGHT, Associate Professor GRAVES, Assistant Professors DUNCAN and BECK.

FORESTRY

(Horticultural Hall)

PROFESSOR LAZENBY, INSTRUCTOR GOETZ

For field work in Forestry, the University estate has a typical primitive woodlot, a fringe of forest trees bordering the Olentangy river, and a good collection of individual trees and shrubs on the campus. Columbus and vicinity offer fairly good opportunities for the study of forestry. Numerous electric car lines take the student at small cost to a variety of hard wood forests, where different conditions and methods of treatment can be studied. Lumber yards, dry houses, wood working industries and saw mills are to be found in and near the city.

In laboratory work, students receive instruction in timber physics and certain features of wood technology, and for this a collection of wood specimens, sections of trees, etc., are provided, and will be increased as rapidly as possible. Students will be encouraged to carry on original work, and to write theses under the supervision of an instructor. Special credit is given for such work, but a thesis is not required for a degree.

The University library contains a good and rapidly growing collection of books and pamphlets on forestry, and quite a number of forestry journals are regularly received.

The department is equipped with a collection of apparatus and woodsman's tools for use in the laboratory and forest.

101. INTRODUCTION TO FORESTRY. Two credit hours. First semester.

A general presentation of the subject, its objects, methods, and economic importance. A study of the trees and shrubs in the University woodlot and on the campus. Lectures and field work.

102. INTRODUCTION TO FORESTRY. Two credit hours. Second semester.

A survey of forest literature and forest organizations, including state and national forest services. A continuation of the study of local trees and shrubs from the forester's standpoint. Lectures and field work.

104. ARBORICULTURE AND TREE SURGERY. Three credit hours. Second semester. Lectures, class room, and field work.

The cultivation and management of trees for various specific purposes, such as windbreaks, hedges, shade and ornament, small plantations for post and pole timber, for maple syrup, for nuts, the farmer's woodlot, treatment of diseased and injured trees, etc.

The above courses, while designed for forestry students, are open and adapted to students of other departments.

105. SILVICULTURE. Three credit hours. First semester.

Lectures and field work. Includes a review of soil, climate, exposure and other ecological factors influencing forest growth; descriptions of typical woodlands and forests; collecting and testing forest tree seeds. Care of woodlands and forests, including natural regeneration, pruning, thinning, protection from fire and other inanimate enemies.

106. SILVICULTURE. Three credit hours. Second semester.

Lectures and field work. Forest reproduction by natural and artificial means; reforestation and afforestation; tree propagation; practice in seedbeds and nursery; sowing seeds and transplanting in forests; establishment, improvement and extension of wood lots; protection from insects and other animate enemies.

107. FOREST MENSURATION, VALUATION, AND TIMBER PHYSICS. Four credit hours. First semester.

Lectures, laboratory, and field work. Methods of measuring the volume of felled and standing trees; of ascertaining the volume of definite forest areas; studying the age, rate of growth and future yield of trees and forests; making stem or section analysis; surveys and estimates of values of trees and forest stands.

The physical properties of wood; wood working plants and industries; uses of wood and wood preservation.

108. FOREST UTILIZATION AND LUMBERING. Four credit hours. Second semester.

Lectures and field work. Methods of lumbering, including transportation, milling, and marketing; minor wood lot and forest industries; by-products of the forest; camping and packing; first aid to sick or wounded.

109. FOREST HISTORY, RELATIONS, AND MANAGEMENT. Four credit hours. First semester.

Lectures and seminar; evolution of forests; statistics of areas, product, and trade; relation of forests to climate, soil, waterways, and general welfare; general forest conditions; surveys and working plans.

110. FOREST ECONOMICS AND POLICIES. Four credit hours. Second semester.

Lectures and seminar; state and national forest laws and organization; state and national forests, and forest problems; civil service regulations; foreign forest service; forest administration.

GEOLOGY

(Office, Room 1, Orton Hall)

PROFESSOR PROSSER, PROFESSOR BOWNOCKER, ASSISTANT PROFESSOR HILLS, MR. MORSE.

The University offers excellent facilities for the study of Geology. By an act of the Legislature it has been put in possession of all the collections made by the State Geological Survey, and these collections have been supplemented by valuable additions of fossils and minerals from various sources. These collections embrace a representation of every geological formation shown in Ohio. Orton Hall, completed at a cost of more than \$100,000, is designed for the permanent accommodation of the large geological collection of the University, and for the work and instruction in the department of Geology. A portion of it, at present, is occupied by the Library and reading rooms. The building is two stories in height, with a high basement; is built of brick and faced with sandstone, and is fireproof throughout. Some of the material was contributed by various quarries of the State of Ohio, and almost all of the finer varieties of Ohio building stone are represented in the columns, walls, and ceiling panels of the vestibule.

162. **ELEMENTARY PHYSIOGRAPHY.** Four credit hours. Second semester. Assistant Professor HILLS.

The physiographic features of the earth's surface and the agencies producing them; the atmosphere, and the ocean. Recitations, lectures, and map work. One period per week will be devoted to laboratory or field work.

165. **GENERAL GEOLOGY.** Three credit hours. First semester.

The first half of the semester, or while the weather permits, field trips will alternate with the laboratory periods. Field trips Friday afternoon or Saturday morning when the laboratory work will be omitted for that week. Professor PROSSER and Mr. MORSE.

Structural, dynamical, and historical geology. The lectures are illustrated by maps, specimens, and lantern views. The common rock-forming minerals and rocks are studied in the laboratory; while in the field various illustrations of geological structure are pointed out and formations identified.

152. **GENERAL GEOLOGY.** Three credit hours. Second semester. Geology 165 repeated. Professor PROSSER and Mr. MORSE.

153. **APPLIED GEOLOGY.** Three credit hours. First semester. Prerequisite, Geology 165 or 152. Professor BOWNOCKER and Assistant Professor HILLS.

The common minerals and rocks of the earth's crust, their breaking down and the formation of mantle rock, fuels, building stones, lime, cement and the most useful metals are studied.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

105. **FIELD GEOLOGY.** First semester.

Lectures, assigned reading, field trips and laboratory work at time to be arranged. Field trips generally on Saturdays while the weather permits, laboratory work the remainder of the semester. Prerequisite, Geology 152 or 165. Professor PROSSER and Mr. MORSE.

Study of the geological formations readily accessible from Columbus, and identification of fossils characteristic of different formations. This course is intended to acquaint the student with the ordinary methods of field investigation, and involves the collection and identification of specimens, the measurements of geological sections, and the preparation of a report describing the region studied.

107-108. **PALEONTOLOGY.** Two to five credit hours. The year. Laboratory open afternoons, 1 to 4, and on certain days in the morning. Prerequisite, Geology 152 or 165. Professor PROSSER and Mr. MORSE.

Careful training in systematic classification which may be used in the philosophical study of the development of plant and animal life, or as a means of becoming acquainted with the fauna and flora that characterize the various geological formations. At first the student devotes some time to conchology, studying recent shells in which the characters used in classification are well preserved, and after this preliminary work, fossils are studied. Fossils afford the most reliable data for identifying and correlating geological formations, and the critical study of faunas is a field especially adapted to independent research. Laboratory, museum, and field work.

167. ECONOMIC GEOLOGY. Three or more hours. First semester. Prerequisite, Geology 152 or 165. Professor BOWNOCKER.

A study is made of the nature of ores, their classification and origin; the metallic ores of the United States, their distribution, abundance, modes of occurrence and origin; the non-metals, coal, oil, gas, clay, lime, cement, building stone, etc. In the discussion of the non-metals, emphasis will be laid on the products of Ohio.

106. GLACIAL GEOLOGY. Three hours. Second semester. Time to be arranged. Prerequisite, Geology 152 or 165. Professor BOWNOCKER.

A study of the glacial geology of North America. The first half of the semester will be given to lectures, assigned readings and map work. The second half, largely to field work and the preparation of reports.

GERMANIC LANGUAGES AND LITERATURES

(Office, Room 317, University Hall)

ASSOCIATE PROFESSOR EISENLOHR, ASSISTANT PROFESSORS THOMAS
AND BARROWS, MR. BUSEY

101-102. ELEMENTARY GERMAN. Four credit hours. The year.

103. INTERMEDIATE GERMAN. Four credit hours. First semester. Prerequisite, 101-102, or two entrance units.

104. EASY CLASSICAL READING AND COMPOSITION. Four credit hours. One semester. Prerequisite, 103, or three entrance units.

106. SCIENCE READING. Four credit hours. One semester. Prerequisite, 103, or three entrance units.

To students offering four entrance units in German, other courses are open. Such students should confer with the head of the department.

HORTICULTURE

(Horticultural Hall)

PROFESSOR PADDOCK, ASSISTANT PROFESSORS DAVIS AND MONTGOMERY

101. PRINCIPLES OF HORTICULTURE. Four credit hours. First semester. Four year course in Horticulture. Assistant Professor DAVIS.

The principles of plant growth, with special reference to horticultural crops, including the problem of tillage, drainage, frosts, weeds, insects, propagation, pruning, and spraying.

102. PRINCIPLES OF HORTICULTURE. Four credit hours. Second semester. Four-year course in Horticulture. A continuation of 101. Assistant Professor DAVIS.

103. OLERICULTURE OR VEGETABLE GARDENING. Three credit hours. First semester. Four-year course in Horticulture. Assistant Professor MONTGOMERY.

Including a study of locations, soils, manures, and fertilizers, marketing, etc., as related to the home and market garden. Each of the garden vegetables is considered specifically.

104. OLERICULTURE OR VEGETABLE GARDENING. Three credit hours. Second semester. Four-year course in Horticulture. A continuation of 103. Assistant Professor MONTGOMERY.

105. POMOLOGY. Four credit hours. First semester. Four-year course in Horticulture. Professor PADDOCK.

Including the propagation, pruning, spraying, cultivating, harvesting, etc., with special reference to the fruit commonly grown in the temperate zone. Tropical and sub-tropical fruits of commercial importance in the North will also receive consideration.

106. POMOLOGY. Four credit hours. Second semester. Four-year course in Horticulture. A continuation of 105. Professor PADDOCK.

107.- PLANT VARIATION. Three credit hours. First semester. Four-year course in Horticulture. Professor PADDOCK.

A course designed for those interested in plant breeding and in the modification and improvement of plants by mutation, crossing, dwarfing, forcing, etc., together with a discussion of the current theories of evolution as applied to the variation and amelioration of plants under cultivation.

108. LANDSCAPE GARDENING. Three credit hours. Second semester. Two and four-year courses in Horticulture. Professor PADDOCK.

A study of the art of producing picture-like or landscape effects; the making of lawns, walks, drives, and the correct planting of trees, shrubs, and flowers for the external adornment of home and public grounds.

109. EXPERIMENTAL HORTICULTURE. Three credit hours. First semester. Four-year course in Horticulture. Time to be arranged.

This course is designed to give the student training in research methods. Technical problems are assigned depending upon the needs and the inclination of the student. This work not only gives practice in the application of extract methods, but affords abundant opportunities to become familiar with the literature of horticulture.

110. EXPERIMENTAL HORTICULTURE. Three credit hours. Second semester. Four-year course in Horticulture. A continuation of 109. Time to be arranged.

111. PRINCIPLES OF HORTICULTURE. Four credit hours. First semester. Two-year courses in Horticulture and Agriculture. Assistant Professor DAVIS.

This course is essentially the same as 101 and 102 modified and adapted to the needs of the two-year students.

112. PRINCIPLES OF HORTICULTURE. Four credit hours. Second semester. Two-year courses in Horticulture and Agriculture. A continuation of 111. Assistant Professor DAVIS.

113. POMOLOGY. Four credit hours. First semester. Two-year course in Horticulture. Professor PADDOCK.

This course is essentially the same as 105 and 106 modified and adapted to the needs of the two year students.

114. POMOLOGY. Four credit hours. Second semester. Two-year course in Horticulture. A continuation of 113. Professor PADDOCK.

115. OLERICULTURE OR VEGETABLE GARDENING. Four credit hours. First semester. Two-year course in Horticulture. Assistant Professor MONTGOMERY.

This course is essentially the same as 103 and 104 modified and adapted to the needs of the two year students.

116. OLERICULTURE OR VEGETABLE GARDENING. Four credit hours. First semester. Two-year course in Horticulture. A continuation of 115. Assistant Professor MONTGOMERY.

118. **POMOLOGY.** Four credit hours. Second semester. Four year course in Agriculture. Assistant Professor DAVIS.

This course deals with the fundamental problems of fruit growing, with special reference to the home or farm orchard and small fruits. The problems of soil location, propagation, pruning, spraying, cultivation, harvesting and marketing receive special consideration.

119. **FLORICULTURE.** Three credit hours. Second semester. Four-year course in Horticulture.

A discussion of the history, propagation and culture of florists' plants, and the diseases and insects that prey upon them.

INDUSTRIAL ARTS

(Office, Room 2, Hayes Hall)

PROFESSOR SANBORN, MR. CROWE, MR. BEEM

The shops occupy the north wing of Hayes Hall and afford excellent facilities for instruction in both the practical details and the underlying principles of carpentry, pattern-making and forging. The carpenter and pattern shops are equipped with fifty benches with complete sets of carpenter tools for each, twenty-four turning lathes with the necessary turning tools, a pony planer, a buzz planer, a circular rip and cross-cut saw, a scroll saw, a band saw, a trimmer, and two power grindstones. The forge shop is equipped with twenty stationary forges with anvils and tools for each, a heating furnace, a gas furnace for hardening and tempering, with pyrometer for high temperature measurements, a foot power hammer, a blacksmith drill, and a punch shear and bar cutter.

SHOP WORK

101 or 102. **CARPENTRY AND PATTERN-MAKING.**

Practice in carpentry and pattern-making, including sawing, planing, mortising, framing, and other work involving the use of the ordinary carpenter tools; and the making of simple patterns.

103 or 104. **FORGING.**

The use and care of forge, fire, and tools; practice in iron and steel forging, including such operations as cutting, bending, drawing, upsetting, shaping, and welding iron; the making, hardening, and tempering of steel punches, drills, and cold chisels.

MATHEMATICS

(Office, Room 314, University Hall)

PROFESSOR BOHANNAN, PROFESSOR MC COARD, PROFESSOR SWARTZEL, PROFESSOR KUHN, ASSOCIATE PROFESSOR ARNOLD, ASSISTANT PROFESSOR PRESTON

103. ELEMENTARY ALGEBRA. Five credit hours. First semester. Text-book, Venable's. Assistant Professor PRESTON.

104. PLANE GEOMETRY. Five credit hours. Second semester. Text-book, Venable's. Assistant Professor PRESTON.

121. COLLEGE ALGEBRA AND TRIGONOMETRY. Three credit hours. First semester.

122. PLANE TRIGONOMETRY AND ANALYTICAL GEOMETRY. Three credit hours. Second semester.

METEOROLOGY

(Townshend Hall)

PROFESSOR J. WARREN SMITH

101. ELEMENTARY METEOROLOGY. Two credit hours. First semester. Text-book, Moore's Descriptive Meteorology.

The ordinary meteorological instruments used by the United States Weather Bureau will be in use and instruction will be given in handling them. The daily weather maps will be studied and the method of making them taught.

102. CLIMATOLOGY, PRACTICAL METEOROLOGY, PHENOLOGY. Two credit hours. Second semester. Prerequisite course 101 or Geology 162.

Special attention will be given to the climate of the United States and of Ohio, the relation of climate to man, the practical benefits to be derived from the daily weather forecasts and warnings, and the effect of weather upon business, manufacturing, health, crime, deportment, and crop yield.

MILITARY SCIENCE AND TACTICS

(The Armory)

CAPTAIN GEORGE L. CONVERSE, U. S. A., RETIRED

The Military Department is open five days during each week. Required of all students first and second year, unless excused by the Military and Gymnasium Board.

1. MILITARY DRILL. One credit hour. First semester. *M., Tu., W., Th., at 11 or 4.* Gallery practice, *M., Tu., W., Th., Fri., 12 to 5.*

2. MILITARY DRILL. One credit hour. Second semester. Drill Regulations, *M., Tu., W., Th., at 11 or 4.* Gallery practice, *M., Tu., W., Th., Fri., 12 to 5.* Field work from about April 1 to end of semester.

PHYSICAL EDUCATION FOR MEN

(The Gymnasium)

PROFESSOR WINGERT, MR. BAUER

1. PHYSICAL EDUCATION. One credit hour. Two hours per week. The year. (a) Lectures on hygiene and physiology of exercise first two weeks, first semester. (b) Corrective: A graded course of free-hand exercise, stretching, relaxing, stimulating, exercise with light hand apparatus for the relief and correction of slight body defects, deformities, improper carriage, etc. (c) Educative: Graded progressive exercise on the apparatus and mats to promote muscular tone, vigor, vitality, endurance. (d) Recreative: Gymnasium games, mental relaxation, non-competitive exercises. (e) Ability to swim is required and free instruction is given to those who cannot swim.

2. ADVANCED EXERCISES. Elective. (a) Advanced exercises on the apparatus and mats. (b) Combative exercises—boxing, fencing, wrestling. A small charge is made to those electing this work. (c) Recreative—football, baseball, basketball, tennis, track and field sport, cross-country running, etc. Special hours are arranged for those electing the above exercise and credit given in regular course.

PHYSICAL EDUCATION FOR WOMEN

(The Gymnasium)

DR. LITTLEJOHN, MISS SAUER

1. PHYSICAL EDUCATION. One credit hour. Four hours per week during first year of a student's residence. (a) Lectures on hygiene and purpose of different kinds of physical exercises, four hours per week, first two weeks of first semester, first week of second semester. (b) Practical work in gymnasium, as follows: (1) Corrective work: exercises for correction of faulty position of different parts of body, and of deformities; for development of chest, etc. (2) Educative work: exercises to develop co-ordination of groups of muscles, accuracy of movement, and to impart grace and beauty and a ready expression of thought in physical motions. (3) Recreative: classic dancing, and rhythmic movements, gymnastic games, and relaxing exercises. (4) Athletics (elective): carefully supervised basket ball, running, etc., for those who desire it. A physical examination is made by the directors of every woman entering this course before she can begin the gymnasium work and, if necessary, special work will be prescribed to meet her physical needs.

2. PHYSICAL EDUCATION. One credit hour. The year. Four hours per week during the second year of a student's residence.

PHYSICS

(Office, Room 24, Physics Building)

PROFESSOR COLE, MR. HEIL

101. ELEMENTARY PHYSICS. Six credit hours. First semester.
Mr. HEIL.

Recitations and laboratory practice. Other courses in Physics may be elected by four-year students in Agriculture.

ROMANCE LANGUAGES AND LITERATURES

(Office, Room 305, University Hall)

PROFESSOR BOWEN, PROFESSOR BRUCE, ASSOCIATE PROFESSOR INGRAHAM,
ASSISTANT PROFESSOR PEIRCE, ASSISTANT PROFESSOR HAM-

ILTON, MR. CHAPIN

1. FRENCH

101-102. ELEMENTARY FRENCH. Four credit hours. The year.
Grammar: Thieme and Effinger's, or equivalent. Reader: Aldrich and Foster's, or Bowen's, First Scientific. Historical and narrative prose; one or more prose comedies. Nine sections. All instructors.

Stress laid first upon the acquisition of a correct pronunciation, after which the entire energy of the student is directed toward the attainment of a full and accurate reading knowledge of the language. Grammar and composition made to contribute to this end. Sight reading emphasized.

103-104. MODERN FRENCH LITERATURE. Four credit hours. The year. Four sections. Prerequisite, course 101-102, or equivalent. Professor BRUCE, Associate Professor INGRAHAM, Assistant Professor PEIRCE, Assistant Professor HAMILTON.

The work of the year deals with the following subjects: (1) Contes; (2) The novel (Balzac or Hugo); (3) Lyric poetry; (4) Romantic drama (Hugo). Prose composition. Systematic attention given to syntax and idiom. Lectures supplement the work. Private reading required.

2. SPANISH

101-102. ELEMENTARY SPANISH. Four credit hours. The year. Grammar: (Hills and Ford's), and Ingraham's Victoria y Otros Cuentos. Easy prose and plays. Composition and practice in speaking. Four sections. Associate Professor INGRAHAM, Assistant Professor HAMILTON, Mr. CHAPIN.

103-104. MODERN SPANISH LITERATURE. Four credit hours. The year. Prerequisite: courses 101-102, or equivalent. Associate Professor INGRAHAM.

The modern novel and drama. Lectures covering a survey of the literature. Composition and practice in speaking continued.

RURAL ECONOMICS

(Townshend Hall)

PROFESSOR PRICE, MR. PHILLIPS

The department includes instruction in farm management, farm accounts, history of agriculture, and agricultural economics.

The facilities offered for the study of farm management include the University farm, containing over three hundred acres, and the records that have been kept of its operations for many years. Adjoining Columbus, and within reach by electric cars, there are many well equipped and well managed farms, which are frequently visited by classes in this department.

For the study of the history of agriculture and agricultural literature, the University Library offers excellent facilities in the large number of agricultural works which it contains and the complete files of agricultural periodicals. In the study of agricultural economics, the State Library, as well as the University Library may be used, and excursions are made in the State to investigate agricultural conditions.

101. FARM ACCOUNTS AND RECORDS. Two credit hours. First semester. Mr. PHILLIPS

Lectures and practice work. The course deals with the general principles of accounting and their application to farm business. Systems of keeping farm records that are best adapted to different methods of farming are studied.

102. FARM MANAGEMENT. Four credit hours. Second semester. Two-year courses in Agriculture and Horticulture. Mr. PHILLIPS.

Lectures, recitations, and visits to farms in the vicinity of Columbus. The course includes a comparative study of the different systems of farm management; the cost of producing and marketing farm products; methods of renting, leasing, and operating farm lands; and keeping farm accounts and records.

103. FARM MANAGEMENT. Four credit hours. First semester. Four-year course in Agriculture. Professor PRICE.

Lectures and recitations upon the problems of farm management, the relative profits of different systems of farm management, and their effect upon maintaining the fertility of the land. The business of farming from the standpoint of the individual is studied.

*104. AGRICULTURAL ECONOMICS. Three credit hours. Second semester. Professor PRICE.

Lectures and recitations upon the production, distribution, transportation, and marketing of agricultural products. The relation of the industry of agriculture to other industries, co-operation in agriculture, agricultural organizations, and the social conditions of agricultural communities are considered.

105. HISTORICAL AND COMPARATIVE AGRICULTURE. Three credit hours. First semester. Professor PRICE.

Lectures and recitations upon the history of agriculture and the evolution of agricultural methods, with special reference to the agriculture of the present day. The development of agricultural literature is studied.

107-108. RESEARCH WORK FOR GRADUATE STUDENTS. Five to ten credit hours. Professor PRICE.

Opportunity is offered to carry on special lines of research in farm management, history and literature of agriculture, and in agricultural economics.

SHOP WORK

(See Industrial Arts)

SPANISH

(See Romance Languages)

VETERINARY MEDICINE

(Office, Veterinary Laboratory)

PROFESSOR WHITE, ASSISTANT PROFESSOR LAMBERT

Students in Agriculture taking required or elective work in Veterinary Medicine can avail themselves of the whole equipment of the College of Veterinary Medicine. For the class-room work, a large number of papier-mache models, wet and dry anatomical specimens, sample horse-shoes, charts, diagrams and drawings, surgical instruments, and apparatus are constantly employed to supplement text-book teaching. The Clinic Building affords excellent facilities for the care and treatment of diseased and injured animals.

*Not given, 1911-1912.

The Veterinary Laboratory building is especially designed for the teaching of Veterinary Medicine. It contains the Veterinary Museum, probably the largest in the country, a modern sanitary dissecting room and laboratories for anatomy, pharmacology, pathology, and bacteriology.

149. VETERINARY ANATOMY. Three credit hours. First semester. Assistant Professor LAMBERT.

Brief outline of the anatomy of the horse and ox.

150. VETERINARY HYGIENE AND SANITATION. Three credit hours. Second semester. Professor WHITE.

The more common sporadic and infectious diseases, minor surgery, castration, horse-shoeing and soundness are briefly considered in this course.

ZOOLOGY AND ENTOMOLOGY

(Office, Room 1, Biological Hall)

PROFESSOR OSBORN, PROFESSOR LANDACRE, ASSOCIATE PROFESSOR HINE,
ASSISTANT PROFESSOR BARROWS, MR. DITTO

Work in this department is largely on the laboratory plan, the effort being to have each student become familiar with typical forms of animal life, acquire the power to discover facts for himself, and use them on practical applications. Animals that have an important economic relation are used as examples for their respective groups. While the aim is to give a thorough and sound training in the underlying principles of zoology and entomology, the practical bearing of these is shown by use of such forms as the liver fluke of sheep to show effects and relations of parasitisms; the earth-worm in its relation to soil formation; trichina as affecting human health and meat exports; insects, both useful and injurious; fishes as a source of food; relation of birds to insect control; and importance of certain groups of birds and mammals as the source of our domestic animals. Advanced and graduate courses provide for training in methods of research,

and especial attention is given to preparation for investigation in experiment stations, and the government bureaus.

101-102. **ELEMENTARY ZOOLOGY.** Three credit hours. First semester, invertebrates to the arthropods. Second semester, arthropods and vertebrates. Professor OSBORN, Professor LANDACRE, Assistant Professor BARROWS.

This course includes a general discussion of groups, dissection of types, and an outline of classification. Especial attention is given to forms of economic importance either from their detrimental effects on crops, stock, etc., or from their utility in various industries or as domestic species.

107-108. **ECONOMIC ENTOMOLOGY.** Three credit hours. The year. Prerequisite, Course 101-102. Associate Professor HINE.

A systematic study of groups of insects, with special reference to injurious and beneficial species. A foundation is laid for special study in Entomology. Preparation of collections, essays, life studies, and use of remedial measures, along with laboratory studies on general anatomy.

109-110. **SYSTEMATIC AND PRACTICAL ENTOMOLOGY.** Three credit hours. The year. Elective in short course in Agriculture. Required in short course in Horticulture. First year. Associate Professor HINE.

111. **PARASITES OF DOMESTIC ANIMALS.** One credit hour. First semester. Elective. Professor OSBORN.

A lecture course devoted to the principal parasites affecting domestic animals, intended especially to meet the needs of those who intend to give particular attention to stock raising.

113-114. **SPECIAL ENTOMOLOGY.** Four credit hours. The year. Elective in Junior or Senior year. Professor OSBORN.

Field work and lectures. Studies of life histories, collection, and classification in selected groups, winter condition of insects, insecticides, insecticide machinery, methods of preparing insect illustrations, investigations of selected groups or species, greenhouse pests, etc. Lectures on insect legislation, inspection quarantine, distribution, natural enemies, special methods of control, etc.

(Courses 113 and 114 are intended as practical courses in entomological research, adapted especially for those who wish to give special attention to this branch with reference to future work in agriculture or horticulture, and to furnish a preparation for those

who have in view work as entomological investigators in experiment stations or as teachers in agricultural schools. They may be taken as graduate courses if not elected earlier, or continued as special lines of research during a graduate course embracing other special subjects.)

129-130. QUANTITATIVE STUDIES IN VARIATION, HEREDITY, AND ANIMAL BEHAVIOR. The year. Critical studies of variation and heredity, including discussions of the categories of variations, origins of variations, mendelian and non-mendelian inheritance, effects of selection, cross-breeding and inbreeding. Statistical and pure line methods of analysis data. Elective. Prerequisite, Zoology 101-102. The course can be adapted to the particular needs of the student. Assistant Professor BARROWS.

143-144. ZOOLOGICAL SEMINAR. One credit hour. The year. Professor OSBORN, Professor LANDACRE, Associate Professor HINE.

Discussion of recent literature in zoology and entomology, reviews of progress in certain lines of investigation and presentation of research studies. Advanced students in Zoology and Entomology are expected to elect this course, and it is open to others who have had preliminary courses.

GENERAL INFORMATION

PHYSICAL EDUCATION

Physical Education is conducted under the direct supervision of the Director, who is a graduate physician and a member of the University Faculty. He is assisted by an associate director for women, also an assistant and twenty student aids, who are selected each year from the upper classmen and those who show proficiency in their work. The main floor of the gymnasium (80 by 150 ft.) is thoroughly equipped with the most modern gymnastic apparatus. It is used by the women in the forenoon while the men exercise in the new gymnasium on the first floor. In the afternoon the main floor is used exclusively by the men for class work, athletics, basketball, recreative games, etc. Regular class exercise two hours per week is required during the first year of a student's residence at the University, or until he has successfully completed one year of this work. A thorough physical examination is made of each student at the opening of the college year. Physical defects, abnormalities, and weaknesses are noted, and judicious, healthful exercise is prescribed to fit the student's individual needs.

CADET SERVICE

Under the law of Congress establishing the University, it is required that instruction shall be given in military science and tactics, and the Trustees have directed that all male students, except those in the College of Law and such others as may be specially excused for physical disability or for having reached the age limit of twenty-five years, shall render two years of cadet service as a condition of graduation.

FEES

All fees must be paid at the opening of each semester as a condition of admission of classes.

TUITION—Tuition is free in this College, but registration is not complete until certain incidental and laboratory fees are paid.

INCIDENTAL FEE—The fee for students who are residents of Ohio is ten dollars a semester. For non-residents, the fee is fifteen dollars a semester. Children of non-resident Alumni pay the same fee as residents of Ohio.

Former students, who do not pay this fee until the third day of the first semester and the second day of the second semester, must pay one dollar additional. For each day of delinquency thereafter fifty cents is added.

LABORATORY FEES—A fee of two dollars a semester is charged for all laboratory courses using gas, water, electrical current or steam. For all other courses which are not purely lecture courses, a laboratory fee of one dollar is charged. Students are required to pay for all materials consumed in laboratory work. To meet the cost of these materials a deposit of five dollars for each course requiring such supplies is made at the Bursar's office before the work is begun. In Chemistry and Bacteriology the deposit is ten dollars. All laboratory supplies are sold at the General Store Room, Chemistry Hall, to students at first cost to the University, and charged against the deposits. Any unused part of the deposit is refunded at the end of the semester.

OTHER EXPENSES

LOCKER FEE—The gymnasium is free to all students, but those desiring to use a locker are charged a fee of two dollars a semester, which includes the cost of towels.

CADET UNIFORM—The uniform with which the members of the regiment are required to provide themselves costs (without overcoat) about thirteen dollars.

It is quiet in pattern, and may be worn in place of civilian dress.

THE OHIO UNION—A fee of one dollar a semester is paid by all male students at registration. This entitles the student to all privileges of the Union, consistent with the Constitution and House Rules governing it.

GRADUATION FEE—A fee of five dollars, to cover expense of graduation and diploma, is required of each person receiving one of the ordinary degrees from the University, and this fee must be paid before the degree is conferred. A like fee of ten dollars is charged each person receiving one of the higher graduate degrees.

ROOMS AND BOARD—Furnished rooms can be rented at one dollar to one dollar and a half per week for each student, when two students occupy a room. Board at the restaurants and boarding clubs near the University costs from two dollars and seventy-five cents to three dollars and fifty cents per week. Board, with furnished rooms, can be obtained in private families at rates varying from five to six dollars per week.

Women Students—As far as possible women students should make arrangements for room and board before coming to Columbus. While the rooms in Oxley Hall, the hall of residence for women, situated on the University grounds, are usually spoken for one or two years in advance, an effort will be made to secure suitable accommodations in private residences. A limited number of women students will be given table board at Oxley Hall at a price not to exceed three dollars and a half a week. Prospective women students should address Miss Emma McKinley, Oxley Hall, Columbus, Ohio.

TEXT-BOOKS—Students should not purchase text-books until they are advised by the instructors of their respective classes.

In order to meet all the necessary expense of regis-

tration, books, uniform and other expenditures incident to securing a room and board, a student should come prepared to expend about fifty dollars during the first ten days of a semester. After that period his board and room rent will constitute the major part of his expenses.

The total cost per year, exclusive of clothing and traveling expenses, is from \$275 to \$400, according to the degree of economy exercised by the student.

FREE SCHOLARSHIPS

A free scholarship good for two years in the College of Agriculture is granted to one student annually from each county in Ohio, but not more than two scholarships can be in force at any one time from any county.

Each scholarship is valid for two years from its grant and covers incidental and fixed laboratory fees. In the chemical laboratories a student holding a free scholarship is required to pay for materials used and to make a deposit to cover breakage the same as other students. In case of other than new students, the scholarship will be accepted only after approval by the Board of Trustees, but in no case will the benefits of scholarships be granted to a student for more than two years. All scholarships must be presented to the Secretary of the Board of Trustees on or before November 1st of the year in which they are to be used, otherwise they are not valid.

The free scholarships cannot be used in the special winter term courses. The appointments are made by the County Boards of Agriculture, and are not transferable by the appointees. To learn whether the scholarship of a given county for the current year has been granted, inquiry should be addressed to the Secretary or President of the County Agricultural Society. For further information concerning these scholarships, inquiries should be addressed to the Dean of this College.

CHRISTIAN ASSOCIATIONS.

The Young Men's Christian Association has come to occupy a prominent place in university life. It has a membership of about five hundred men, and is affiliated with the World's Student Christian Federation.

Religious meetings are held for men on Sunday afternoon; there are also frequent meetings for the promotion of social intercourse and good fellowship. Courses in systematic Bible study and in modern missions are offered. A most helpful feature of the work is that in the interest of new students at the opening of the school year. Desirable rooms and boarding places are found and posted for reference at the Association Office. Representatives of the Association meet the trains, assist students in finding satisfactory locations, and endeavor in every way to make them feel at home. The Employment Bureau helps to find work.

A copy of the Students' Handbook, giving information about Columbus, the University, and the various college organizations and activities, will be sent free to prospective students. For this handbook or for further information, address the General Secretary of O. S. U. Y. M. C. A., University Campus, Columbus, Ohio.

The Young Women's Christian Association holds religious meetings regularly at noon on Tuesdays. This organization is active and efficient in working for the higher interests of the young women.

SELF SUPPORT.

There is a large amount of work on the University farm and campus and in the gardens, orchards, and greenhouses, which can be done by students, and for which they are paid at current rates for such labor. Each year several thousand dollars are paid out in this way. By this means, together with what can be earned by steady labor during

the summer vacation, a considerable number of students defray all their expenses.

Preference is given to students who are willing to devote a certain number of hours each day to the work assigned.

Work cannot be promised to all applicants, and is not guaranteed to any.

Applications for employment should be made to the Superintendent of the University farm. Labor blanks will be furnished upon request.

AGRICULTURAL EXTENSION.

Agricultural Extension was organized to carry instruction from the College of Agriculture to the people living some distance from it. So far this instruction has been given principally in schools of Agriculture and Home Making, each conducted for one week. The Agricultural Extension School is secured upon the application of twenty-five persons. Only one can be granted annually for a county. The following courses are offered for a school:

ANIMAL HUSBANDRY SCHOOL. Soil Fertility, Farm Crops, and Animal Husbandry.

DAIRY SCHOOL. Soil Fertility, Farm Crops, and Dairying.

HORTICULTURAL SCHOOL. Soil Fertility, Farm Crops, and Horticulture.

Only three courses are given in a school.

HOME MAKERS' COURSE. Cooking, Baking, Canning, Home Decorations and Home Economics.

No farm or household practices are given except such as are incident to the study of principles.

In addition to conducting schools, demonstrations in the mixing of fertilizers and in the application of spray mixtures are made, agricultural and educational exhibits

at important fairs and expositions are supplied, instruction for the agricultural trains is furnished, and special bulletins, designed to awaken an interest in agricultural education, are published.

Nearly fifteen thousand men and women have attended the Agricultural Extension Schools; a few less than twelve thousand have visited the agricultural trains; thirty thousand farmers, teachers, and children receive bulletins published by this department every month.

For a bulletin of information concerning these Agricultural Extension Schools, address the University Editor. For information not contained in this bulletin and for information regarding other forms of Extension work, address the Superintendent of Agricultural Extension, Ohio State University, Columbus.

The Ohio State University Bulletin is issued at least fifteen times during the academic year; monthly in October, November, and June, and bi-weekly in December, January, February, March, April, and May.





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